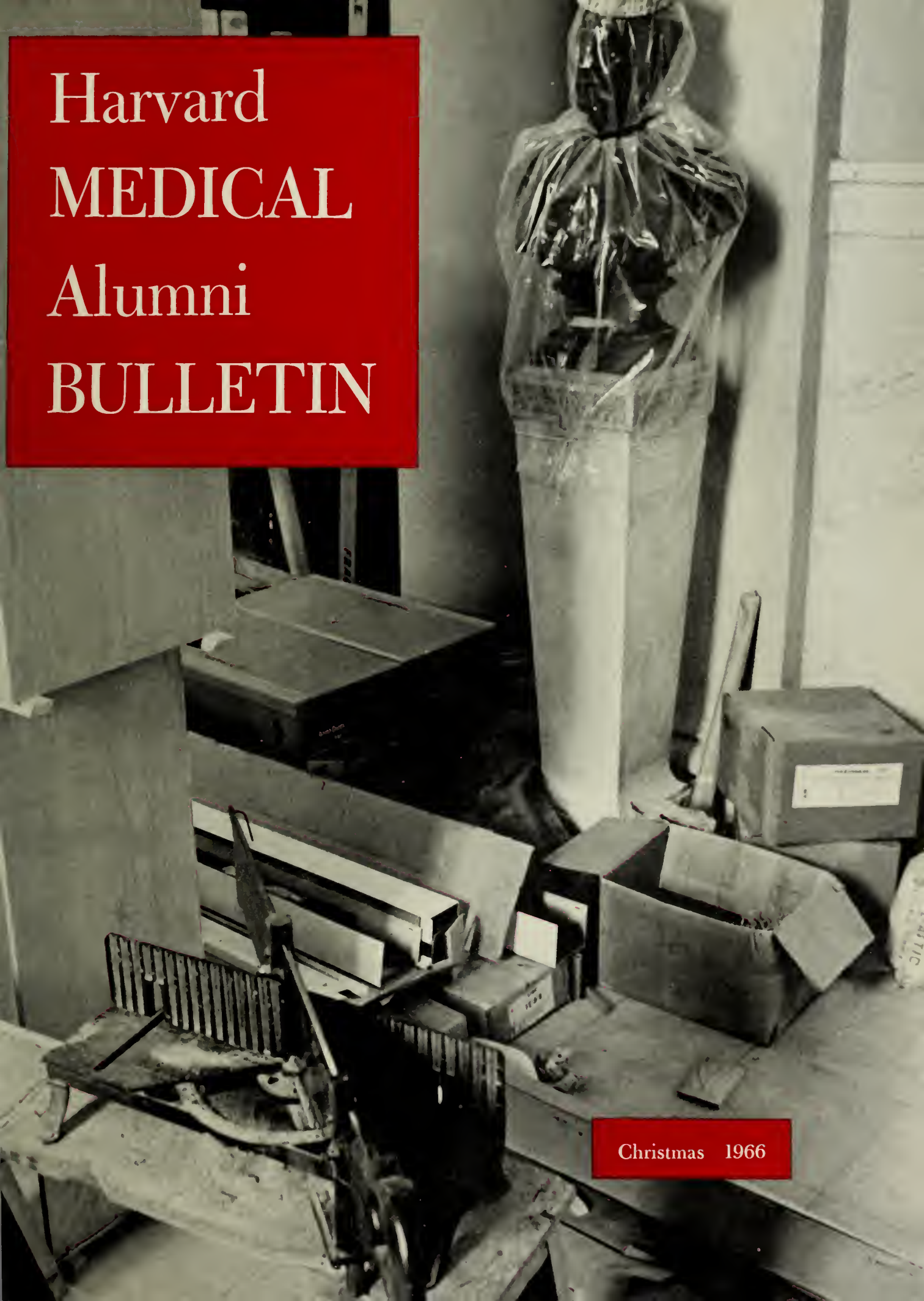
Harvard MEDICAL Alumni BULLETIN



Christmas 1966

HARVARD MEDICAL ALUMNI BULLETIN

Vol. 41 Christmas 1966 No. 2

COVER: During the recent first floor renovations, an unusual role was forced upon the familiar bust of Louis Pasteur. It became a useful, albeit aseptic, hat rack in an otherwise crowded environment. Photographed by Bradford Herzog (Harvard '50).

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The opinions of contributors to the Bulletin *do not necessarily reflect those of the Editorial Staff.*

ANATOMY 1966

The Era of Functional Cytology

by Don W. Fawcett '42

THE ACTIVITIES of the Department of Anatomy were last reported in the *Harvard Medical Alumni Bulletin* six years ago. At that time, Building B was undergoing a remarkable transformation from its turn-of-the-century interior to fine modern laboratories. Several new staff members had recently arrived following the change of chairmanship, and the department was sharing fully in the new excitement and confidence that had begun to permeate the whole field of Anatomy after improved methods of specimen preparation for the electron microscope opened up a large new area of structure for visual exploration. Two new electron microscopes had been installed and four more were to follow. With the greater reach which these powerful instruments provided, each new organ examined yielded a bountiful harvest of new information. Anatomy seemed to have embarked upon a new era of descriptive cytology comparable to that which followed the introduction of well-corrected lenses for the compound microscope a century earlier. The discoveries have indeed been very numerous, and Harvard has contributed its full share.

Despite heavy teaching obligations in relation to the size of the staff, members of the Department of Anatomy have written over two hundred scientific papers in the past five years. In the same period, seven books have been published: *Histology* (McGraw-Hill) edited by Roy O. Greep and with a number of contributors from the department; *Textbook of Histology* (W. B. Saunders Company) by William Bloom and Don Fawcett; *An Atlas of Fine Structure: The Cell* (W. B. Saunders Company) by Don Fawcett; *The Human Cerebellum, An Atlas of Gross Topography in Serial Sections* (Little Brown and Company) by Jay Angevine, Elliott Mancall and Paul Yakovlev; *Regeneration* (Holt, Rinehart and Winston), a monograph by Elizabeth Hay; *Studies on the Pyriform Lobe* (Harvard University Press) a monograph by Facundo Valverde.

It is impossible in a brief article of this kind to present an overview of the current research of an entire Department. It is hoped, however, that selected examples will convey an impression of the breadth of its interests and diversity of its approach. The interplay of morphological, physiological and biochemical methods, typical of modern anatomical research, is exemplified in recent work aimed at defining more clearly the functional significance of the system of membrane-bounded tubular elements in the liver cell, called the endoplasmic reticulum. This organelle occurs in two forms. One is called the granular reticulum because of the presence of ribonucleoprotein granules—ribosomes—on the outer surface of its membranes; and the other, lacking these particles, is called smooth reticulum. Correlated morphological and biochemical studies in recent years have clearly established that the granular reticulum is principally concerned with protein synthesis, but considerable uncertainty has prevailed as to the function of the smooth-surfaced reticulum. Pharmacologists in this country and in Germany, have shown that administration of the common sedative, phenobarbital, to animals for a few days, results in a marked elevation in the activity of a group of liver enzymes that are responsible for the metabolism of barbiturates and a variety of other drugs. These enzymes are associated with the microsomal fraction of liver homogenates. Dr. Jones and his collaborators in the Department of Anatomy have confirmed in electron micrographs that phenobarbital given for three days to fasted hamsters rapidly induces a remarkable increase in the abundance of smooth reticulum. (Fig. 1) This response is not considered to be a toxic effect of phenobarbital but rather an adaptive response of the liver that enables it to metabolize the inducing drug more rapidly. The increases in the cytoplasmic membranes and in the associated drug-metabolizing enzymes very probably represent the morphological and biochemical basis for the development of drug tolerance.

Apart from the potential clinical interest of these findings, the "phenobarbital effect" provides the cell biologist with a useful pharmacological device for manipulating the relative proportions of rough and smooth-surfaced cytoplasmic membranes. Dr. Albert Jones and Dr. David Armstrong have now taken advantage of this to adduce further evidence that the smooth endoplasmic reticulum plays a role in lipid and cholesterol metabolism. Liver slices, obtained from animals given phenobarbital to induce hypertrophy of the endoplasmic reticulum, incorporated C^{14} acetate into cholesterol *in vitro* at nearly five times the rate of incorporation of slices from untreated animals.

The liver also plays a decisive role in the synthesis and transport of other lipids and in the maintenance of constant lipid levels in the blood. The blood lipids may be derived from food, from fat reserves in adipose tissue, or they may be synthesized from carbohydrates. Whatever their source the main vehicle by which the lipids are carried is plasma lipoprotein. It is in the liver that their transformation into lipoproteins takes place, but until recently the organelles chiefly responsible and the intracellular secretory pathway were not known. Dr. Jones, in collaboration with Dr. Ruderman and Dr. Herrera of the Joslin Research Laboratories, has now demonstrated that the isolated rat liver perfused with physiological salt solution containing bovine serum albumin and linolenic acid, releases into the perfusate a uniform population of 30 to 100 mμ particles with the properties of low density lipoprotein. (Fig. 2) By examining biopsies of the perfused livers with the electron microscope at various time intervals, particles could be demonstrated in the smooth endoplasmic reticulum and in membrane-bounded vesicles opening and discharging their content into the perivascular space of Disse. Thus among its other functions, the smooth reticulum of the liver, in cooperation with the granular reticulum, appears to play an important role in formation of low density lipoprotein.

Left: Dr. Fawcett in his office. He is Hersey Professor of Anatomy, James Stillman Professor of Comparative Anatomy, Head of the Department and Curator of the Warren Museum, HMS.

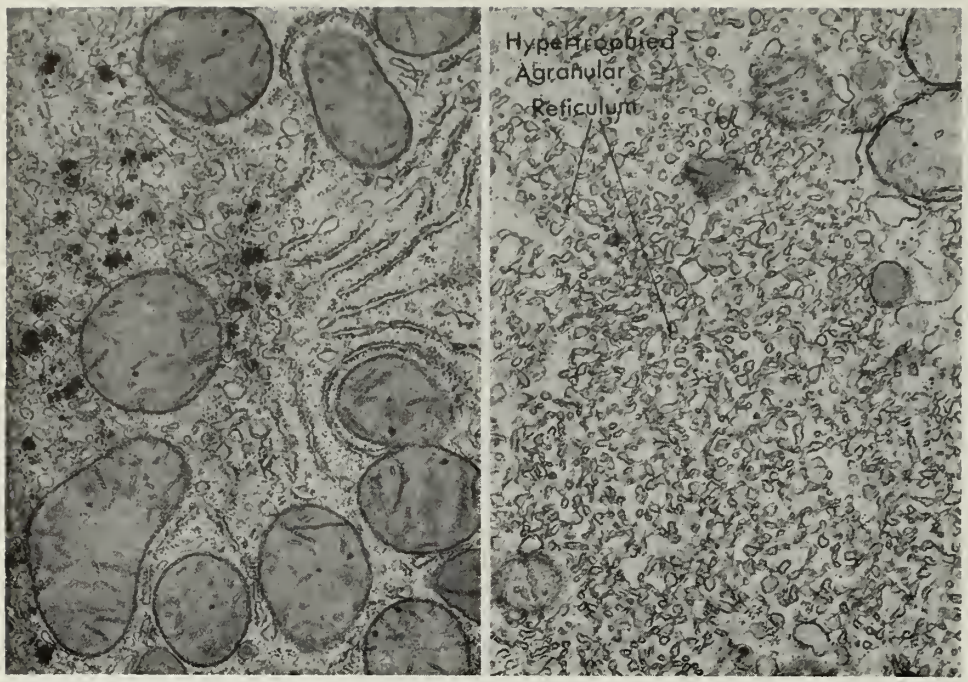


Fig. 1 Electron micrographs of similar areas of liver cells cytoplasm. At left, the normal appearance of the organelles in a control animal fasted three days. At right, a fasted animal that received phenobarbital shows the remarkable hypertrophy of the agranular reticulum.

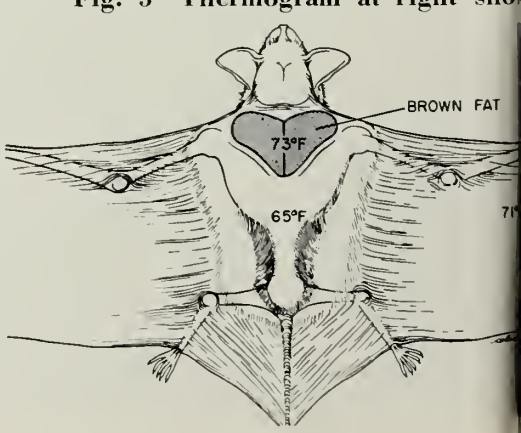
AN ACTIVE PROGRAM of research in the nervous system is guided by Dr. Sanford Palay, Bullard Professor of Neuroanatomy. The possibilities for fruitful, descriptive cytological studies at the electron microscope level in this incredibly complex organ are almost unlimited. Indeed in all but a few regions, one must still work out the detailed structure and cellular interrelations before meaningful experimental work at the cellular level can be undertaken. Among the problems currently under investigation is the fine structural basis of dysfunction in the supraoptic nucleus in a strain of rats with hereditary diabetes insipidus. After a detailed preliminary study of the cytology of this region of the brain, Dr. Paula Orkand has found that in rats with diabetes insipidus, where vasopressin synthesis is impaired, the supraoptic neurones are enlarged and both the Golgi apparatus and the Nissl zones are conspicuously enlarged, but neurosecretory granules are rarely found. The nerve terminals on the supraoptic neurones appear to be normal. In the supraopticohypophyseal tract, the axons are enlarged up to five times their normal diameter. The increase in size of the cells is interpreted as a compensatory hypertrophy in the face of a genetic block to some essential step in the biosynthesis of vasopressin.

A relatively new approach in neuroembryology is being used by Dr. Jay Angevine and Dr. Elizabeth Taber Pierce to investigate the early histogenesis of the mammalian forebrain. This study attempts to answer the questions: where and when do the neurones arise and what path do they take from their site of origin in the primitive ependymal zone to their destination in the cortex? The method makes use of radioisotopes to tag individual cells following the rationale of bird-banding as practiced by the ornithologist to trace migrations. Tritium-labeled thymidine is given at different developmental stages and the embryos or neonatal animals are killed after various time intervals. The nuclei of those neuroblasts that are preparing for division at the time of injection, incorporate the labeled precursor into their DNA—the others do not. The nuclei of this group of cells can be identified in autoradiographs by the silver grains deposited in the overlying layer of photographic emulsion. Preparation of histological sections in this way, from a series of successive developmental stages, permits the day-by-day tracing of the paths followed by the labeled neuroblasts during morphogenesis of the brain. Such studies not only provide valuable fundamental information on the development of the brain, but may provide new insight into the mechanisms by which certain patterns of synaptic connections are established.

The field of environmental physiology and comparative biochemistry is represented in the collaborative work of Dr. Charles Lyman and Dr. James Adelstein on hibernating species. In efforts to study the renewal of cell populations in hibernating animals, it was found that autoradiography could not be successfully carried out in the ground squirrel because this species fails to incorporate significant amounts of tritiated thymidine into its DNA, whether active or dormant. Under the same conditions, the rat, hamster and other species showed excellent incorporation in autoradiographs. This surprising finding has led to studies on the comparative utilization of thymidine by rodent species. The low incorporation of thymidine observed *in vivo* in the ground squirrel is also found in serially propagated cells *in vitro*. This does not appear to be due to a block in synthetic pathway in this species or to an expanded thymidine pool size, but rather to an exceptionally active thymidine catabolism.

Another intriguing problem that has long puzzled physiologists concerned with hibernation and hypothermia has been the source of the heat necessary for the warming of hibernating animals from 4° C. to 37° C. during the brief period of their arousal from dormancy. Recent evidence from other laboratories had suggested that the brown adipose tissue might serve as a sort of chemical furnace and a major source of heat for arousal in some hibernating species. In collaboration with Dr. Eric Ball, Dr. Hayward has studied the relative rates of warming of various tissues and has employed the new technique of thermography to obtain a pictorial demonstration of the site of heat production in the bat during arousal from hibernation. The thermograph scans the infrared radiation from surfaces and registers the temperature-dependent intensity of radiation on a photographic plate (Fig. 3). When the arousing bat was scanned, the thin wing membranes had rapidly equilibrated with the ambient temperature and most of

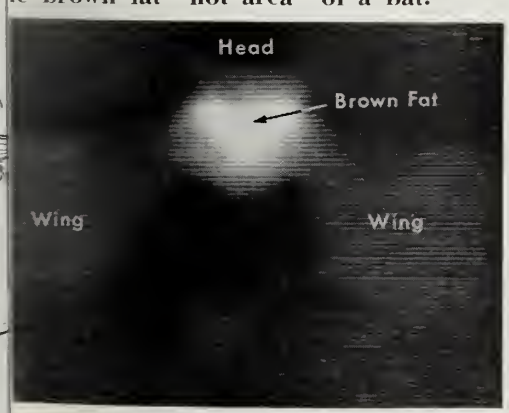
Fig. 3 Thermogram at right sho



the body was still relatively cool, but there was a sharply delineated "hot area" coinciding with the interscapular brown fat. These findings provide additional evidence that the brown adipose tissue acts as a chemical furnace (an oil burner indeed). Norepinephrine activation of lipase in the fat cells results in rapid breakdown of triglyceride to fatty acid and glycerol. Re-esterification of the fatty acid then occurs with further consumption of oxygen and generation of heat that warms the blood flowing through the brown adipose tissue. This secondarily raises the temperature of the animal as a whole.

A new race or species of hamsters has been imported from Turkey which breed readily in the laboratory and hold considerable promise for studies on natural hibernation. They hibernate almost at once when exposed to the cold in the autumn, whereas the familiar Syrian hamster enters into fitful hibernation only after weeks of exposure to cold. The availability of these two kinds of hamsters may offer the possibility of cross-breeding to explore the degree to which the ability to hibernate is under genetic control.

Study of the structure and chemistry of the cell surface holds the key to an understanding of its permeability, its motility, its ability to conduct an impulse, its cohesion with the membranes of neighboring cells and many other properties basic to life. Dr. Susumu Ito is engaged in an electron microscopic, autoradiographic and cytochemical analysis of a filamentous mucopolysaccharide component recently found on the luminal surface of the cells lining the gastrointestinal tract. This layer appears under the electron microscope to be made up of delicate branching filaments 30 to 50 A thick. They are fixed at their base to the trilaminar cell membrane and project radially from the tips of the



ıe brown fat "hot area" of a bat.

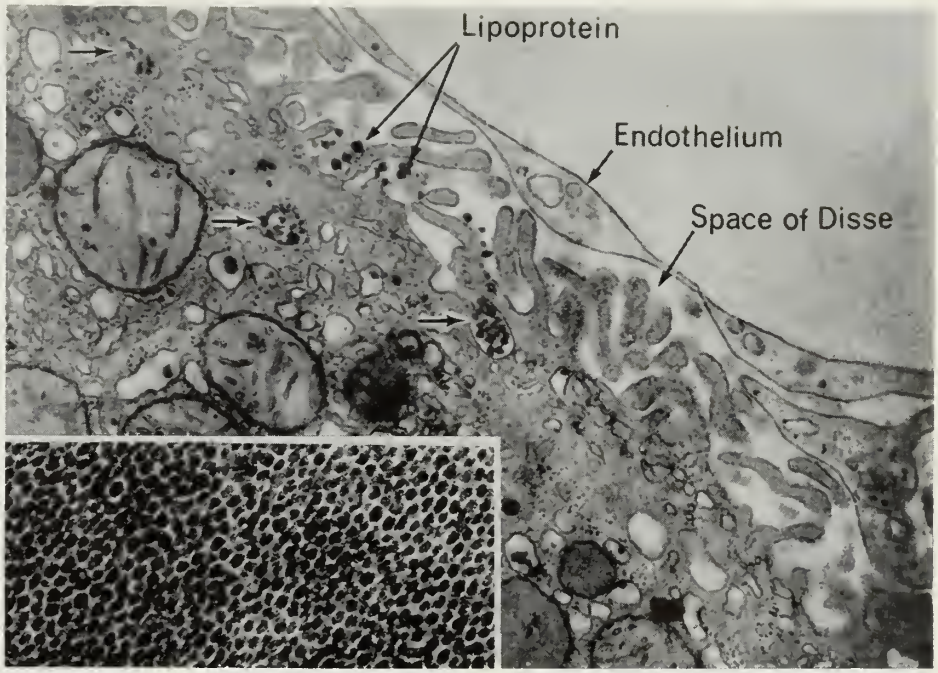


Fig. 2 The sinusoidal surface of a cell from a liver perfused with Krebs solution, albumin and fatty-acid. Dense granules of newly synthesized lipoprotein are seen in vacuoles, some are being discharged into the perivascular space of Disse. Inset: secreted lipoprotein particles recovered from perfusate.

thousands of submicroscopic microvilli on the intestinal cells. (Fig. 4) This component of the membrane is found to be extraordinarily resistant to a wide variety of proteolytic and mucolytic agents. Autoradiographic studies have established that it is formed by the cells and turns over with a fairly short half-life. It is not yet clear whether it has a purely mechanical, protective role or plays an active part in the physiology of intestinal absorption. This is but one facet of a continuing interest of the Department in the important problem of the nature of the cell surface. An increasing number of different kinds of carbohydrate-containing cell coatings are being described. There are indications that the distinctive physiological characteristics of the surface membrane on different cell types may depend as much upon the properties of its associated polysaccharide as upon the molecular organization of its phospholipids and the enzymatic content of its proteins.

Embryology has advanced beyond the descriptive morphological phase. It is now concerned with the interactions between cells and the forces underlying the specificity of their adhesion and guiding their morphogenetic movements. It is clear that the recent unraveling of the genetic code will lead on to equally exciting efforts to understand cell differentiation during development, in terms of the mechanism of the orderly temporal sequence of masking and unmasking of specific parts of the chromosomal DNA molecules. Before notable progress can be made in this direction, we must know more about the functions of the nucleolus, the origin of the ribosomes, the sites of synthesis of specific cell products, and the pathways and the regulation of traffic between nucleus and cytoplasm. The Departmental efforts in these new directions of developmental biology are guided by Dr. Elizabeth Hay, Louise Foote Pfeiffer Associate Professor of Embryology. We now know that the nucleolus is the source of ribosomal RNA that participates in protein synthesis in the cytoplasm. Dr. Hay, in collaboration with Dr. John Gurdon of Oxford University, England, and Dr. Donald Brown of the Carnegie Institution for Embryology in Baltimore, has been taking advantage of one of Nature's own experiments—a mutant of the South African frog whose cells lack a nucleolus. Biochemical studies by Gurdon and Brown demonstrated the inability of the anucleolate homozygous embryos to carry out ribosomal RNA synthesis. Dr. Hay is extending the study to the ultrastructural level.

Another investigation of the role of the nucleolus is being carried out by Dr. Brita von Gaudecker using autoradiography to localize RNA synthesis in the large nucleoli of the midge—*Chironomus*. This mosquito-sized insect offers a great advantage. It has giant chromosomes ten times longer and almost a hundred times

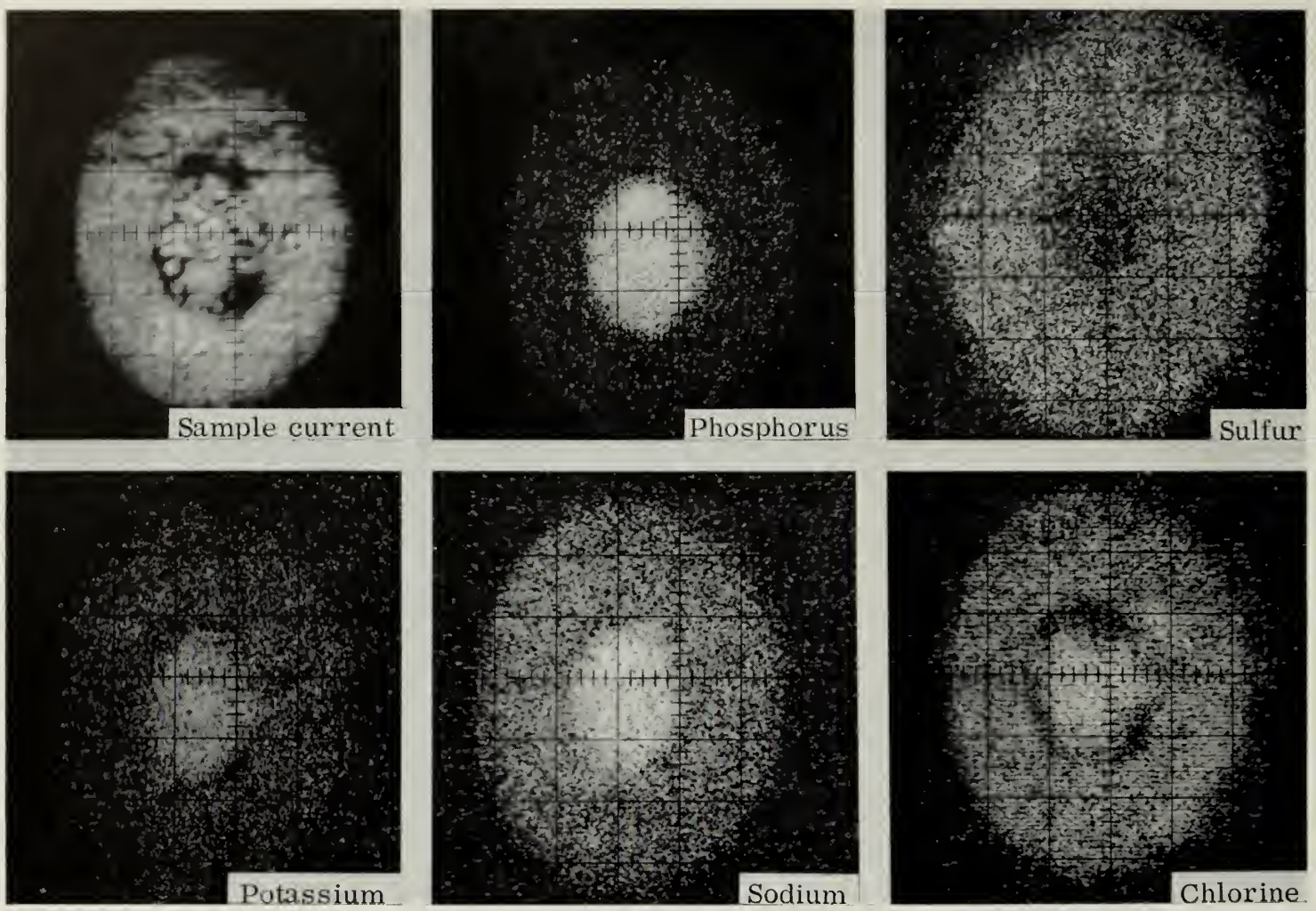
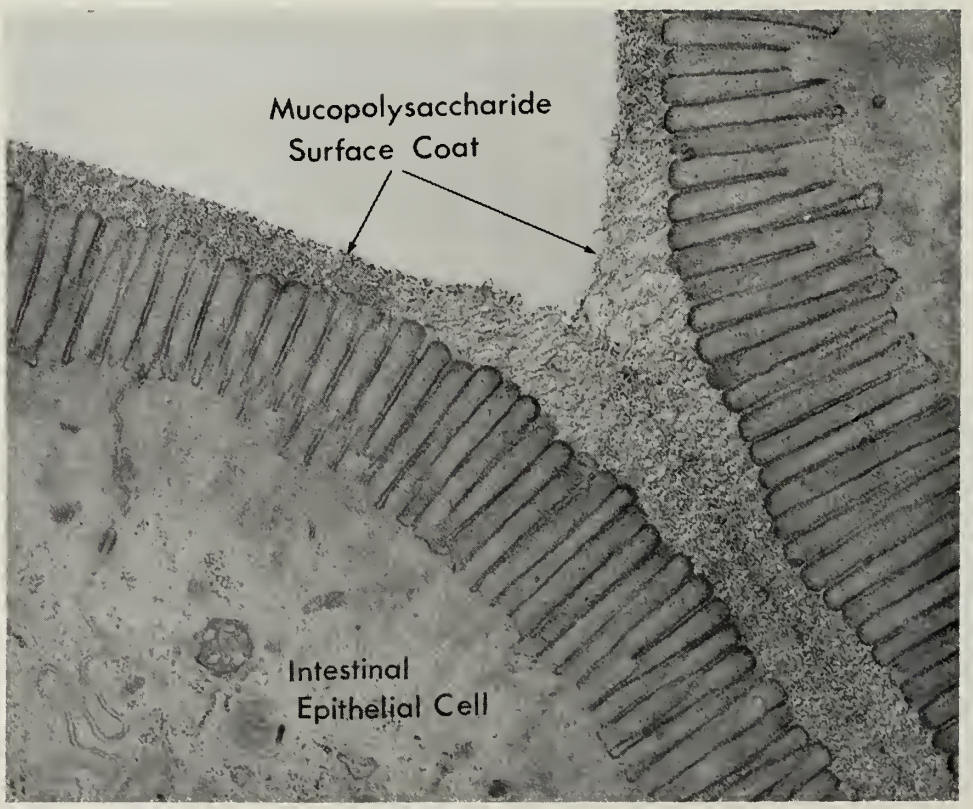


Fig. 6 Images of a nucleated amphibian erythrocyte made with the electron probe microanalyzer. The light areas represent areas of high concentration of the element under study.

Fig. 4 Micrograph of small portions of the specialized border and subjacent cytoplasm of two intestinal epithelial cells. The tips of the microvilli are covered with a mucopolysaccharide surface coat of fine filaments fixed at one end to the cell membrane.



thicker than those of man, and its large nucleolus is attached to a particular site on one of these huge chromosomes. To gain the advantage of large size of the cell components, Dr. von Gaudecker has to cope with a challenging technical problem. She must inject radioactive isotope through a micropipette into the siphon of the larva of this minute insect, and then tie off the appendage with a few of the filaments obtained by untwisting and teasing apart a slender silk thread (Fig. 5) Autoradiographs of ultrathin sections of the cells examined with the electron microscope indicate that RNA synthesis occurs first in the central filamentous area of the nucleolus near the associated chromosome and the product subsequently moves into its peripheral granular zone. The findings are helping to clarifying the origin of nucleolar RNA and the functional interrelations of the filamentous and granular components of this organelle.

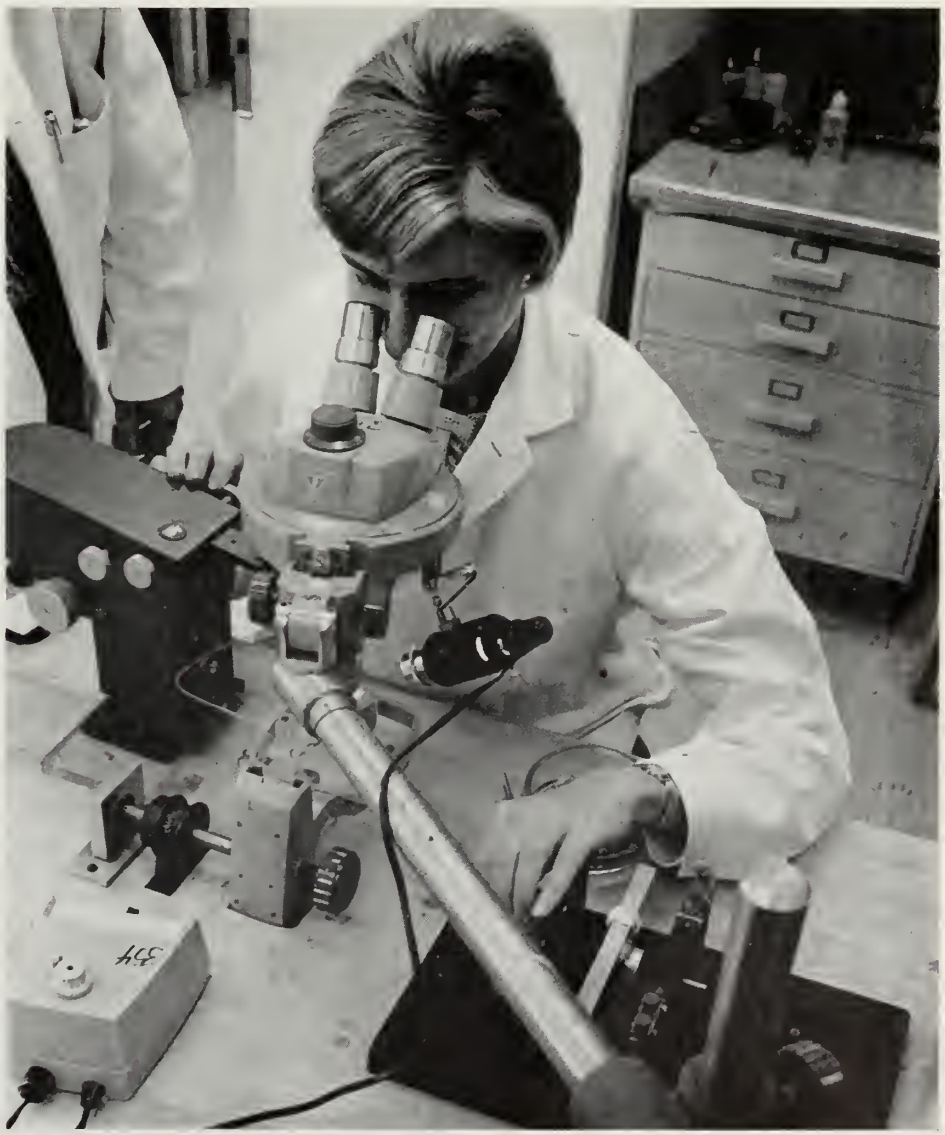
THE MOST DISTINCTIVE feature of the modern anatomical approach to biological problems is its insistence upon discovering the location of chemical constituents and the site of occurrence of particular metabolic events in their natural setting in the cells and tissues. The common approach of biochemistry, which depends upon homogenization and centrifugal isolation of subunits for analysis in bulk, destroys at the outset, topographical relations that may be highly significant. In morphology, on the other hand, one makes every effort to retain the original spatial relationships of the visible structural components and to identify their chemical nature *in situ*. The recent extension of our knowledge of structure to the electron microscopic level has greatly increased the difficulty of divising methods for *in situ* chemical analyses that have sufficient precision to yield meaningful results. Dr. Jean-Paul Revel's research is concerned with these problems. In addition to his efforts to improve the resolution of electron microscopic autoradiography, he is exploring the possible biological applications of the electron probe microanalyzer, a complex and expensive instrument already widely used for quantitative elemental analysis in geology, metallurgy and allied fields. A slender electron beam of low accelerating potential strikes the section, exciting the emission of long wavelength X-rays by the specimen. An analyzer set for the wavelength characteristic of the element to be analyzed, measures the emission in proportional counter. At the same time, the distribution of the element in the specimen can be recorded in an image in which the pattern of light areas reflects the location and relative abundance of the emitting element. By changing the setting of the analyzer to a new wavelength, the topographical abundance of another element can be recorded from the same specimen. The instrument has the capability of quantitative analysis for all but four of the elements. Its limitations for biological application reside in its damage to the specimen and its resolution, which at the present time is probably no better than five microns; but there appears to be no insuperable technical obstacle to the development of the smaller beams that would provide the resolution needed for regional analysis within cells of the usual size. (Fig. 6)

The Department's research interest in cell biology is reflected in its teaching. Many of the new findings on cell and tissue ultrastructure are now incorporated into the course in histology and cytology with the conviction that the major advances in investigative pathology in the next decade will be made with the electron microscope. If the students are given some experience in interpretation of electron micrographs now, they will be able to read the literature with understanding and discrimination during their active professional life. Serious sampling and technical problems, however, will long limit the usefulness of the electron microscope in diagnostic pathology. The Department, therefore, continues to take seriously its responsibility for teaching identification of the normal tissues and organs at the light microscope level as the basis for the study of histopathology.

All laboratory instruction in embryology has long since disappeared but, in a series of lectures devoted to developmental anatomy, an effort is made to present enough classical embryology to account for the major events in organogenesis and to provide a basis for understanding the origin of the major congenital malformations. Also presented are some of the recent experimental advances in the analysis of inductive phenomena, specific cell and tissue interactions in morphogenesis and other subjects that appear to be overtures to exciting future developments in our understanding of the mechanisms of differentiation.

Neuroanatomy is taught in cooperation with the neurophysiologists. The Department endeavors to present a general appreciation of the functional organization of the nervous system together with some of the recent contributions of electron microscopy to our knowledge of neurocytology and synaptology. (*Cont. on page 8.*)

Fig. 5 Dr. Brita von Gandecker using a micromanipulator to inject radioactive precursors into the larva of a midge, in studies on the origin of the nucleolar RNA.

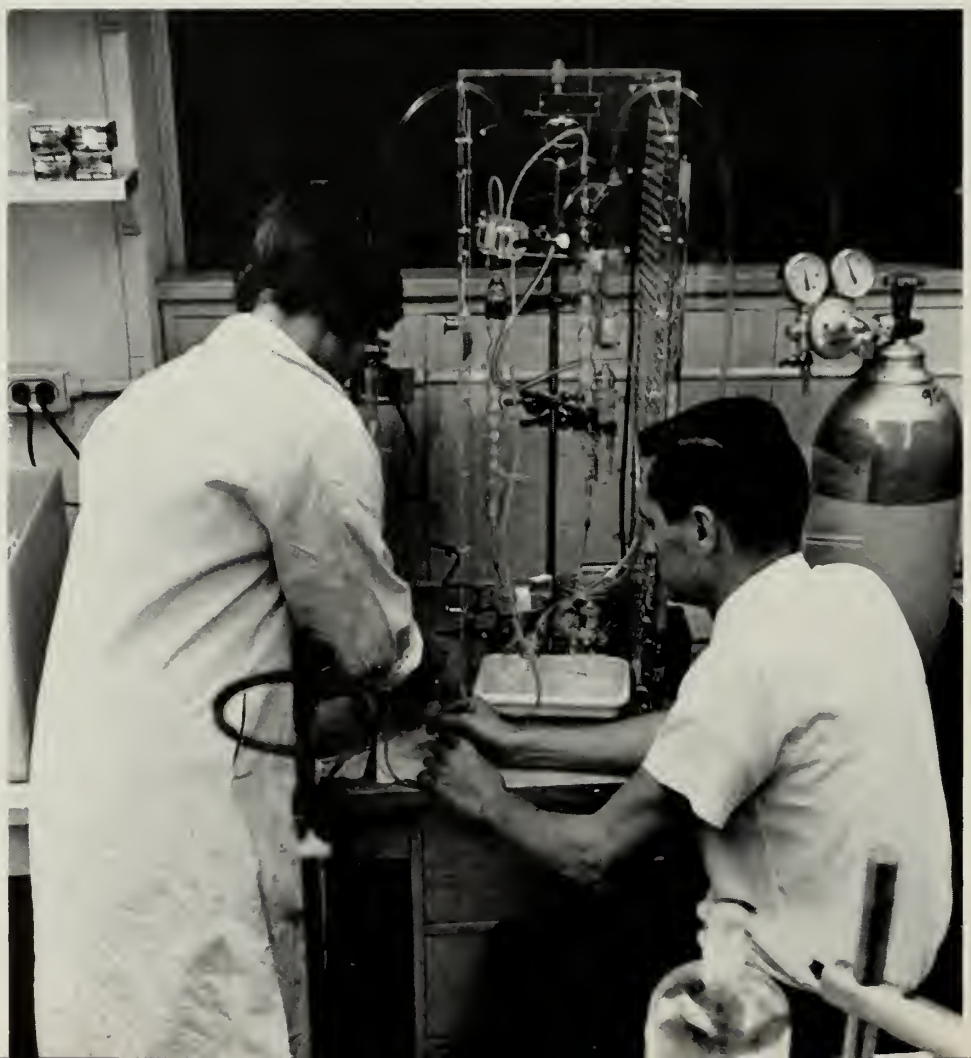


Dr. Sanford L. Palay, Bullard Professor of Neuroanatomy with Dr. Ita R. Abramof.

THE TIME DEVOTED to Gross Human Anatomy in the curriculum is increasingly coveted by younger disciplines and its traditional place as a major required course in the curriculum is being challenged in several medical schools. The gross structure of the human body has been studied by dissection since the fifteenth century. Understandably, its research frontiers are now quite limited, but in our view it remains an indispensible, applied science, basic to clinical medicine. Surely much of physiology and biochemistry would seem mere abstractions if studied without some relation to the body as a whole. New and better ways can be found to teach Gross Anatomy, but its continued strong representation in today's curriculum needs no justification to the thoughtful physician. In later life, we tend to be more appalled by how much of our knowledge of anatomy has slipped away, than we are comforted by how little we have retained. When confronted with a patient with physical or radiological evidence of pulmonary disease, there is no substitute for having once seen the disposition of the lungs in the open chest. And in surgery, to have once studied the structures in a bloodless field is certainly an advantage. And quite apart from all the forgotten anatomical relations, who can estimate the value of the 6,000 to 8,000 new terms learned in the traditional first year? Those from anatomy especially remain and are a part of the daily working vocabulary of the physician for his lifetime. There is also an inescapable logic in the traditional placement of Gross Anatomy early in the first year. We see a curious inconsistency in the proposal to devote the first semester, or indeed the whole first year, to cell biology, while at the same time introducing students to patients.

At a time of mounting pressures for radical curricular revision, a report of a Department would be incomplete without a statement of its teaching philosophy. The Anatomy Department tends to adopt a conservative position in the continuing colloquy over the curriculum. Although it is true that in research, the basic sciences now differ less than formerly in the nature of the questions they ask of Nature, they still differ significantly in their approach to the answers. We believe that these distinctive differences in their approach to biological problems are worth preserving and that the students' educational experience is enriched by exposure to them. There is certainly a need for reorganization of the curriculum to achieve more flexibility and freedom of choice, but this can be achieved within the framework of a modified block system of instruction with responsibility for teaching centered in the existing departments. In our view, a system encouraging clear identification with a discipline, loyalty to the common interests of a department, and the rewarding sense of pride and proprietorship in a separate course in their own subject, will best insure continuing enthusiasm of the basic science faculty for its teaching. The flow of knowledge from faculty to students becomes each year more choked by the flood of information and we are forced by the progressive strictures of curricular time to be increasingly selective. If forced to choose in the context of coordinated teaching, the danger is real that the preclinical departments, caught up in the excitement of fundamental research advances, will elect to teach the new to the neglect of the commonplace, but nonetheless essential, information upon which the contemporary practice of medicine is based.

Dr. Albert L. Jones and Miss Dency Baldwin set up apparatus for perfusion of the liver, in their studies on the intracellular sites of synthesis of low density serum lipoprotein.



EDITORIAL

Strikes, Turnouts, Sticks

Elsewhere in this issue of the HMAB is described a "strike" that occurred at the University of Antioquia in Colombia. Viewed by us in the U.S., through the eyes of HMS III student, Jonathan Trobe, it is an astounding occurrence that at once reflects the variance in education between ours and that in Colombia. According to the *Encyclopedia Britannica* "strikes (often called turnouts or sticks in the early 19th Century) are concerted refusals to work under the conditions required by employers." Strikes for us have always implied labor unions, unhealthy working conditions and poor pay. For such a concept to be applied to education, and graduate education at that, is indeed appalling.

The "strike" of those medical students in Colombia was born of a law, "decreto 36" which required them to pay back, after graduation, the amount of money the University had invested in their education. This strike apparently successfully halted the teaching of medicine for a large number of students for a long period of time.

We can find some satisfaction in the knowledge that these events probably "can't happen here." And yet, contrary to the belief of the students in Colombia, our students are clearly not "passive" and "lacking in social and political conscience." One only has to view the University scene at Berkeley to get a glimpse of such "passivity" or "lack of social conscience."

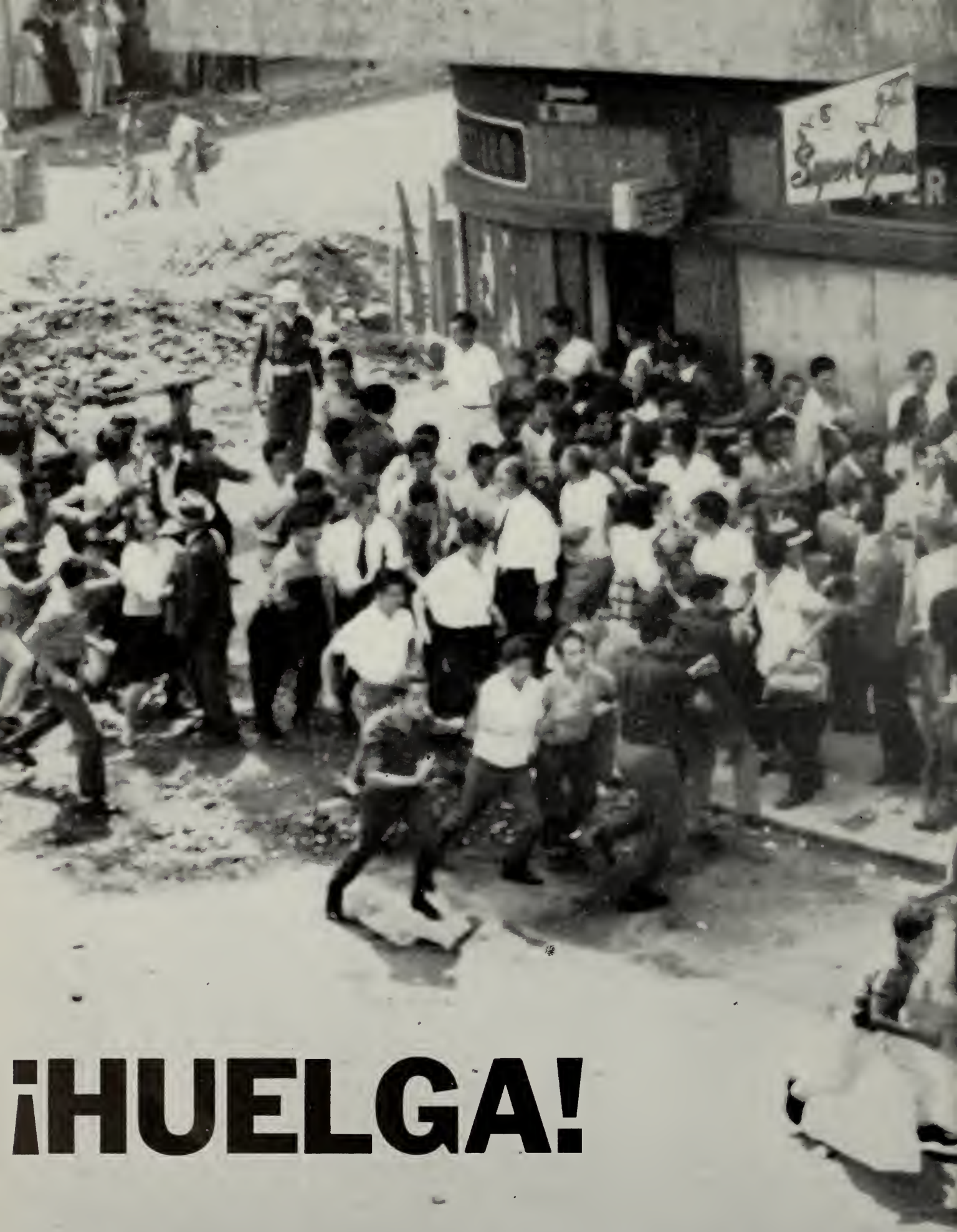
There are two very distinct differences between our students and those in Colombia—differences that are particularly evident at the graduate school level.

First, the American student, by and large, understands the importance and indeed the advantage of expressing his grievances in an orderly manner. Perhaps he owes this feeling to his legalistic inheritance from Anglo-Saxon Law. Perhaps he is more mature and sees the faults of an emotional outburst. American students have had their "turnouts" in the Spring in response to unpopular University rulings, but generally, the serious approach to undoing such distasteful rulings is by committee at the conference table. The recent second-year curriculum change in pathophysiology at HMS is an example.

Secondly, and this is most particularly pertinent to Harvard, it is unthinkable that an American University would enforce such a financial ruling upon its students. In fact, through scholarship and fellowship aid, many students in colleges and medical schools are helped financially to carry otherwise impossible monetary loads. This far greater availability in America of scholarship and fellowship aid practically precludes a "strike" of this nature.

American foundations understand the importance of this financial aid to scholarship, aid which, in supporting the qualified student, thereby supports the progress of the country as a whole. But, it is also perhaps time that we note that nowhere else in the world is there a body of University graduates that has better understood its debt to education, or been better able to heed its responsibility to support education, than in America.

J.R.B.



¡HUELGA!

by Jonathan Trobe '68

This summer, students at the University of Antioquia in Medellin, Colombia went on strike. The following is an eyewitness account of that strike; what caused it, the violence that accompanied it, and its outcome.

IF THE SEVEN OF US WHO HAVE spent the summer in Medellin had been born here instead of in the United States, we would probably be attending the University of Antioquia Medical School. We would learn more or less the same medicine; but the way we would spend our free hours would astound the Anglo-Saxon mentality.

To be sure, there are a few things here that make us feel we are not too far from Harvard. The 70 students in the first-year class at Antioquia, who were carefully selected from 800 applicants, cover the same material, in the same order, as we do at HMS. Many of the professors have been to Harvard, and in the parking lot there are two cars bearing HMS stickers from Sparr's Drug Store.

Fifteen HMS II students spent this past summer doing public health work in Colombia. The program, started in 1961, by Dr. Joseph J. Vitale, is sponsored jointly by the USPHS and the Millbank Foundation, and is supervised by the Harvard School of Public Health. The students went to three cities in Colombia and worked there with professors on projects ranging from a study of breast-feeding practices, to a study of whether teaching hygiene, building a new water supply, or providing shoes, is the most effective means of eliminating parasitic disease. In their free time, and evidently there was plenty of it, they did other things...

There the similarities end. Medical school in Medellin may be a serious business, but you would never know it. Rarely does a class begin less than 15 minutes late. The hallways and the student cafe are more crowded than the library or the classrooms. In the shade of palm trees just outside the building, there is another cafe where students get their shoes shined for six cents while they sip *tinto*—Colombian coffee in a demitasse cup. The two-hour lunch hour begins at noon, and by 12:05 the buildings and parking lot are deserted. The same casual attitude prevails in the hospital. Student rounds are scheduled for 8 A.M., which really means sometime during the morning when enough students are around. No one seems pressed, and even in the hospital there is always time for a *tinto*.

Actually, we have had little time to watch the medical students at work. Three weeks after we arrived, the entire student body of the University went on strike. No one has been to class or to the clinics for five weeks. A day does not go by without a newspaper headline about the strike. In fact, the Spanish word for strike, *huelga*, must have been about the third word we learned after *buenos dias* and *muy caro*.

Student strikes are nothing new here. Antioquia averages about one strike a year, with losses of up to 20 school days. The strikes wreak havoc with the medical school curriculum and a professor of parasitology told us that his department never bothers to formulate a detailed program for students because a strike is bound to come along and upset the schedule. So they improvise.

Colombian students are astonished to learn that American universities are never beset by strikes. For them, the strike is not an ultimate weapon to be used after other efforts at conciliation have failed. It is practically an automatic action whenever there is a dispute with the faculty or administration. Not even the townspeople question the use of the strike as such. Their arguments center around the timing of the strike, how long it should last, and whether the students have a just cause. The strike is more than a tactic: it is a way of life. And, as we watched the 1966 edition unfold, we discovered that the student strike, as practiced here, is not part of a plan of peaceful coercion. It is the first step in a civil war.

THE EXCITEMENT BEGAN ONE morning six weeks ago. The Medellin papers ran a headline story stating that the state legislature had passed "decreto 36" —a law requiring all Antioquia students to pay back, after graduation, the amount of money the University had invested in their education. The magic sum was never specified in the law, nor was the period of payment. The University was

to work that out. But student leaders started a rumor that the amount was to be $10,000, about 50 times the average now paid.

The next day, the students assembled their ranks. If the government said study now and pay later, they would strike now and study later. Meetings of the student bodies of all the University Faculties were called to decide the question. The medical school meeting was a treat. The six presiding student council members sat at the front of the hall, poised for action. Although they are bona fide students, they have been active politically since high school. They are brilliant orators; they know all the innuendos of demagoguery; and they know how to manipulate parliamentary procedure. They quickly sensed that the majority could be swayed.

First they gave their interpretation of the pernicious "decreto 36." Spokesmen from the conservative ranks were shouted down, interrupted, or limited to two minutes speaking time. Members of the opposition were razzed before they even got to their feet. The anti-strike faction was defeated when the council president, with a little legerdemain, did away with a secret ballot. In a riotous show of hands, the students voted a strike "of indefinite duration."

It was often difficult to assess the feelings of the majority of students toward the strike. At the outset, no one was particularly unhappy. School had become dull, and it was always fun to flex one's political muscles. Even the most conscientious students felt they had a just cause. People went on short holidays. The library was deserted. All teaching stopped.

In the meantime, the student leaders did nothing to reach an agreement with the Governor and the legislature about the evil decree. Not only did the students refuse to present an alternate proposal, or to debate the issues, but they refused to consider suspending the strike even if the legislature agreed to meet in a special session. The students were adamant. Abolish the decree and then we will talk.

It soon became clear that those who had planned the strike had no intention of solving it. For if they had, they would not have made two obvious mistakes. First, the timing of the strike was totally inappropriate. The state assembly had not been in session since the strike began. A special session was unlikely because of a peculiar system whereby the presidency of the legislature alternates between Liberals and Conservatives. It was the Liberals' turn, and they did not want to waste their advantage on a short meeting. Secondly, the students had lost a potentially strong ally in the professors by striking without consulting them.

As the strike rolled into its fourth week, the students divided themselves into the following groups:

1. A small minority, about 10%, were becoming nervous about missing classes which the University rector had announced could not be made up.
2. The majority, about 80%, were more or less indifferent, felt a little guilty, but supported the cause, and enjoyed the vacation. They were not at all disturbed about losing so much school time, and felt powerless to oppose the leaders.
3. The leaders, perhaps 5%, ran the student assemblies to suit their own ends, and were responsible for the terror.

These leaders expressed themselves through street demonstrations. The townspeople have come to fear these demonstrations, or *manifestaciones*, as they are called here. As soon as a sizeable number of students gathers in a public place, the whole district becomes tense. Military police, wielding transparent plastic shields and tear gas bombs appear everywhere, traffic is rerouted, everyone finishes his business and clears out. Shopkeepers pull down metal screens over their store windows, and the inevitable order comes down from the University rector to close all the gates of the school.

The *manifestaciones* follow a familiar pattern. They start out innocently—a parade of one or two hundred pickets. But the parade gathers momentum as it reaches the commercial downtown area, and the cordon of shield-bearing police tightens. Suddenly a student throws a rock and soon the area is a bedlam of flying rocks, tiles, bricks, and finally, tear gas bombs.

The most exciting encounter of this kind took place on August 20. The *manifestacion* started about 3:00 in the afternoon and by 5:00 the police had forced the students to withdraw to the square near the University General Studies building. During that two-hour battle, the students turned over several cars, wrecked a taxi stand, broke apartment windows, and cut electricity and telephone wires for the entire neighborhood. Shortly after 5:00 the demonstrators retreated inside the University gates where, by tradition and law, they are unassailable. Were the police to enter here, they would be violating the students' most sanctified "autonomy of the University." Soon the students appeared on the roof of the General Studies building. They peeled off the roof tiles and flung them at the MP's below. About 250 of them holed up inside the building until early the next morning, when they finally crept out. This *manifestacion* was considered benign compared to the one that took place a year ago. It bears repeating because it illustrates more vividly the transition from strike to terror which has become a way of life here.

In front of the Antioquia State House, students demand repeal of "decreto 36." This was the most peaceful demonstration of the summer.

EARLY IN MAY OF 1965, students in Medellín were outraged by the U.S. invasion of Santo Domingo. They decided to march on the Consulate, despite a strict order from the Governor against such action. The students gathered anyway, but the police forced them back to the General Studies building. This time, not only did the demonstrators throw roof tiles at the police, but they methodically wrecked everything inside the building. The Governor called the University rector, Ignacio Velez Escobar, who was in Bogotá. He explained what was happening and asked for permission to storm the building. Escobar gave his permission. By doing so, he violated university automony, and a 20-day period of chaos ensued. This, in turn, led to a Presidential order which placed the country in a state of siege.

The students wanted Escobar's head. Antioquia immediately declared a strike, and the National University of Bogotá and other schools followed suit. Escobar was quarantined in his house with a three-man guard. During a sympathy demonstration in Bogotá, a law student was killed. In protest, students in Medellín staged a mock funeral. They got themselves a big, black casket, and 2,000 irate students turned out in mourning dress. Led by girls, eight abreast, the procession and the casket marched silently down the boulevard from the medical school. Again the police intervened and tear gas bombs forced the paraders back toward the school. One of the bombs exploded in the face of a third-year medical student and caused a complete perforation of his eye.

The students backed into the medical school and the adjacent hospital. By chance, there was construction going on at the medical school—lots of handy bricks. The fighting was heavy at the school but never at the hospital. As one student explained, they were more cautious about missile-throwing because "the patients might have been hurt." But at the school, things were completely out of control. Students broke into the histology labs and smashed microscopes and slide collections. The histology professor later resigned because he refused to teach "wild animals." Another group of marauders discovered the dean and assistant dean in their offices. They tied them to chairs and then the students stretched out in executive style. A special presidium met to decide whether they should throw the dean off the fourth floor, castrate him, or just shave his head. They decided to shave his head.

The students refused to leave the medical school until the resignation of Escobar was announced. When no word came, they decided to camp out in the building and, according to one source, most of them spent the night in the assembly room, singing, playing music, and telling stories. By morning, the President of Colombia had "requested" the resignation of rector Escobar. The students had won.

Except for Escobar's "fatal error" in violating university autonomy, he was considered an exemplary rector. Several professors told us that Escobar raised a vast proportion of Antioquia's endowment, and fostered a complete reorganization of the medical school, including the installation of modern labs and the replacement of part-time professors with full-time men. But during the "terror," student leaders found ways to inflame their followers against Escobar. One tactic was to falsely attribute to him a statement that the University was not for poor people or Negroes. To this day, the students still hate Escobar and during one of the *manifestaciones*, this summer, they burned his car.

This type of irrational behavior continues. One day, students blocked a bus carrying primary school children and shelled the vehicle with rocks. Several children were badly hurt. And recently, a student who heads an anti-strike committee was walking by the General Studies building when he was ambushed by a group of strikers who were occupying the building. They carried him inside, where police may not enter, undressed him, shaved his head, and then tossed him back into the street.

IT IS DIFFICULT TO EXPLAIN this sort of action simply on the basis of immaturity or irresponsibility. There are other, more far-reaching motives involved. For example, law 36, the subject of this summer's strike, was first revealed in November, 1965. No one made a fuss then. The student leaders waited six months before "discovering" the heinous act, and they announced the

This is the General Studies building, the headquarters of the strikers. Painted on the outside walls are the letters FARC. The words mean, "let us enter the revolutionary fight by joining Communist youth."

Above: MOLOTOV COCKTAILS, recovered by the police after a riot. Ingredients; pop bottle, gasoline, rocks, rag, and a match. Light the rag, fling the bottle, and run. On impact, the gasoline will ignite. The rocks are for ballast. Below: Medellin. A street. 5 P.M. A Molotov Cocktail about to be thrown. At right: Waiting for adventure, student leaders stand guard atop an occupied University building.

strike this July—one week before the inauguration of the new President of Colombia. In last year's *manifestaciones*, police records show that 25% of the persons arrested were not students, but known agitators. In fact, the standard apology for the terror is that it is the work of agitators, not of average students. This is probably true of the more extreme actions, but in the less daring adventures, the agitators are joined by at least 20% of the student body.

It is also true that if the Communists are not directly aiding the strikers, they are at least definitely interested in them. Radio Havana has been sending in a constant beam of vocal support, and whenever the students leave a building, scribbled on the walls is the telltale "FARC"—Colombian Armed Revolutionary Forces, a wing of the Communist Party.

One of the most influential student leaders is openly a member of the Party. Although more than 30 years old, he is a third-year law student—an *estudiante profesional*—who does poorly enough academically to stay back, but well enough so that he is not thrown out. His political experience goes back over several strikes, and he is well-practiced in the tactics of mass action and subversion. At the height of the turmoil last year, he and fellow strikers in Medellin had the support of four other universities and several thousand labor unionists. At that time, Radio Havana boasted that "we have youth and labor on our side. Now we must gain only the peasants."

Little wonder then that former President Valencia feared the political power of the students and always gave in to them. In six years, they have not lost a fight. As a result, the balance of power between the students and the faculty has been destroyed.

In the U.S., the notion that students should have a voice in the running of a university is unthinkable. Colombian students believe they have the right to do anything. They have great disdain for American students, whom they see as passive entities, cowed into docility, and lacking social and political consciences. Whereas most U.S. students do not consider themselves full members of society, the Latin students see themselves as part of an elite which is responsible for reforming the evils of the status quo. Even society as a whole, treats them as special, granting them such privileges

as "university autonomy."

The students in Latin America have a right to gripe because conditions in the universities are far from ideal. In the natural sciences, the students must contend with outdated equipment and shortages. Many universities, in their haste to provide academic freedom, were generous with life-time tenure professorships. Often there is no compulsory retirement age, and the professors are required to teach only a minimum of classes. Students complain that these professors frequently do not show up, or come late, and when they do come, they often teach material that is outdated by a century. Aside from the tenure professors, most of the faculty is part-time. University salaries are appallingly low and many teachers must supplement their income by "moonlighting."

As a result, teachers do not feel intimately associated with the universities, and relations with students are cursory. The students, in turn, do not live at the universities. Finally, the students see no hope coming from the rectors and politicians, whom they regard as reactionaries in a slow-moving bureaucracy that is dead set against them.

Add to this a little Latin passion for the dramatic, and it is easy to see why the students would rather fight than talk. Law 36 was only an excuse. Anarchy and violence are not means to an end, they are ends in themselves. The students are prepared to offer violence at the slightest provocation. Aside from the loss of school time, Medellin has suffered significant property losses and personal injuries.

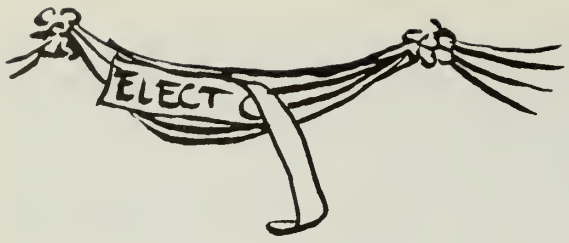
This was the state of affairs that confronted the new President, Carlos Lleras Restrepo, upon his inauguration in July. The strike had entered its fifth week when he made a courageous and auspicious move. To stop the anarchist trend among the students and to restore the balance of power, he closed the University of Antioquia. He intended to keep it closed until the next semester, which begins in February, 1967. Lleras stated that his government would not tolerate strikes and the violence that accompanies them. The students could have their choice of stopping the strike or sitting at home for six months. Seven thousand students were affected.

The University announced that 15 students would be expelled for disciplinary reasons. (Last year, Antioquia expelled only one student, and that was because he had failed two courses.)

"Militarist!" cried the student leaders. They compared Lleras to dictator Ongania of Argentina who recently abolished "university autonomy" to strengthen the government's hand against student terrorism. Medellin students called for a nation-wide university and trade union strike, and occupation of all state schools. But when the day came to strike, nothing happened. Instead, 1500 students signed a petition backing the President.

In a last ditch, rear-guard maneuver, 50 student leaders captured the General Studies building. They brought in enough provisions to last four months—said to be supplied by leftist unions. But already the spirit of the revolt was broken. The *manifestaciones* stopped, and everyone called for their surrender. They did, and the government offered a revised curriculum for the present semester. On September 12, 1966, classes resumed.

The student movement lost, and lost badly. Law 36 still stands. The students will probably have a chance to affect the details of the law—the amount to be paid and the period of payment. But, they will have to do it through peaceful bargaining—a practice in which they have very little experience.



BOSTON POLITICS

in

HISTORICAL PERSPECTIVE

by Timothy E. Guiney '66

During my years at Harvard Medical School, I have been impressed by the fact that many physicians and medical students have little understanding or appreciation for the Boston political scene. They are often quick to criticize what they do not understand—hardly a scientific attitude. In a larger sense, I feel that such an attitude reveals an unfortunate strain that permeates much of American medicine. Many physicians regard a politican as a corrupt, self-seeking pirate, diverting public funds to his own devious ends, and totally beyond the control of the electorate. This outlook ill equips physicians for rational political behavior when they have political issues forced upon them. There appears to be a recoiling from public affairs which does little credit to the intellectual and educational level of the profession as a group.

I will talk about Boston politics for two reasons. The first reason is because Boston does not enjoy particularly high esteem in the minds of many of my colleagues as a paradigm of civic virtue; and the second, because I live here, and have been fascinated for many years by what I think is "the greatest show on earth."

Since Boston in 1966 is only understandable in terms of what has gone before, I will attempt to trace historically some of the major forces in its political climate. I have divided the discussion into the following broad areas: Pre-immigration Boston; The Immigration Period; The Bosses and the "Politics of Revenge"; The Decline of the Politician as Hero; Municipal Government in the Sixties; and finally, A Brief Look at the Boston City Hospital, which I think mirrors the entire process.

Two themes recur. These are the two diametrically opposed political traditions of the principal antagonists in the story, the Yankees and the Irish. In Boston, Yankee means roughly "of English North American stock" and includes within it the tiny subgroup Boston Brahmin, a group with important differences, which will be pointed out later. I have used the terms "Irish" and "immigrant" interchangeably because of the distinct political style evolved by this earliest immigrant bloc and because this style has been adopted by most successful politicians of all immigrant backgrounds in Boston until the present day.

The two themes, which arose because of the different needs of the two groups, are well stated by Richard Hofstadter in his book, *The Age of Reform:*

Boston in the 18th Century.

One, founded on the indigenous Yankee Protestant political traditions and upon middle class life, assumed and demanded the constant, disinterested activity of the citizen in public affairs, argued that political life ought to be run, to a greater degree than it was, in accordance with general principles and abstract law apart from and superior to personal needs, and expressed a common feeling that government should be in good part an effort to moralize the lives of individuals while economic life should be intimately related to the stimulation and development of individual character. The other system, founded on the European backgrounds of immigrants, upon their unfamiliarity with political action, their familiarity with hierarchy and authority, and upon the urgent needs that so often grew out of their migration, took for granted that the political life of the individual would arise out of family needs, interpreted political and civic relations chiefly in terms of personal obligations, and placed strong personal loyalties above allegiance to abstract codes of law or morals. It was chiefly upon this system that the political life of the immigrant, the boss, and the urban machine developed.[1]

Pre-Immigrant Boston

Boston in the early 1840's was a homogeneous, prosperous seaport town with a population of about 84,000 according to the state census of 1840. It was a commercial rather than an industrial town in that there were no large-scale establishments and no large concentrations of labor. The major fortunes had been amassed through seagoing trade and later banking. The triangular traffic in rum, sugar and slaves had long since ceased; the enterprises in the Pacific Northwest and China had arisen, and in their turn, had begun to wane; Boston merchants had become merely middlemen. Boston's surrounding countryside was not productive agriculturally and it was not until the advent of cheap textiles from the newly developing mills in the "industrial hinterlands" of the Merrimac Valley, that the city's trade acquired a truly stable base. The various enterprises, built as they were on speculation and daring, were uneven in their return, but did generate a large amount of capital which turned Boston into a banking and financial center.

Prior to the immigrations, there was no genuine proletariat in Boston. The city remained, as it had been, a collection of artisans, shopkeepers, and merchants.

Bostonians in the early nineteenth Century, surrounded as they were by tangible evidence of their success in commerce, government, and laws, developed a self-conscious confidence in their way of life. There was very little poverty by the standards of the day; social evils such as drunkenness and prostitution were no more than minor annoyances, and there was very little crime.[2]

The stern puritanism of early colonial days had given way to Unitarianism, and the period of religious restlessness gave rise to Transcendentalism and other such speculative doctrines. The liberation of thought thus reflected turned in large measure toward the founding of an American literature and to the perfectability of man's earthly abode. The age became one of great confidence and optimism, wherein it was firmly held that no problem was insuperable, and that all questions relating to man's state were susceptible to solution. Henry Adams, writing in 1905, looks back upon the Boston of the 1840's thus:

> Viewed from Mt. Vernon Street, the problem of life was as simple as it was classic. Politics offered no difficulties, for there the moral law was a sure guide. Social perfection was also sure, because human nature worked for Good, and three instruments were all she asked—Suffrage, Common Schools, and Press. On these points doubt was forbidden. Education was divine, and man needed only a correct knowledge of facts to reach perfection. Nothing quieted doubt so completely as the mental calm of the Unitarian clergy. In uniform excellence of life and character, moral and intellectual, the score of Unitarian clergymen about Boston, who controlled society and Harvard College, were never excelled. They proclaimed as their merit that they insisted on no doctrine, but taught or tried to teach, the means of leading a virtuous, useful, unselfish life, which they held to be sufficient for salvation. Boston had solved the universe, or had offered and realized the best solution yet tried. The problem was worked out.[3]

Boston, then, before the immigrant onslaught, was a relatively tolerant, liberal and progressive community whose political life was directed by the high moral tone imposed upon it by its best families and clergy. The citizenry, though still more inbred than in other cities of the day, was becoming cosmopolitan, looking to London and Paris for many of its tastes, styles, and intellectual trends.[4] It was to this tranquil setting of peace, prosperity, and civic pride that the armies of Irish immigrants came in the spring and summer of 1847.

Boston 200 years later.

The Immigration Period

Prior to 1847 those who had immigated to Boston were considerably different from the impoverished hordes of Irish who began to arrive in that year. The French Huguenots, Germans, political dissidents from many countries, and several thousand of the more perspicacious or well-situated Irish, had arrived in small groups. They had enough literacy, money and skills to enable them to either become quickly assimilated into the daily life of the city, or, more likely, to push on to the West where arable land was plentiful.

Not so with the Irish who arrived in 1847. Although the reasons for the sorry lot of the Irish peasant are too many to discuss in detail, a brief outline at least is necessary for understanding the situation which existed in the 1840's in Boston.

A succession of repressive measures, the most infamous of which were the Penal Laws of 1695, had been enacted by the British Parliament. These were instituted in retribution for support of Catholic Ireland for the Stuarts in an uprising which saw James II and an Irish army defeated on Irish soil. The support of Ireland for the Stuarts was based on the knowledge that only by the defeat of Protestant England could Catholic Ireland prosper. The intent of the Penal Laws was to prevent a recurrence by reducing the Irish to political impotence. Catholics in Ireland were banned from the army, navy, law, politics, ownership of land, and attendance at schools. The result was widespread lawlessness among the population, to whom all officials became the hated enemy, and for whom unjust laws became the stimulus for the setting up of one's own laws.[5]

The system of land tenure was one in which the peasants were basically sharecroppers. A population explosion had inexplicably begun about seventy years earlier, and the result was that the meager peasant tenancies were divided and subdivided to make room for the swelling populace. The peasant's diet by this time consisted solely of potatoes and milk. The men knew how to cultivate little else, and the women had seldom cooked anything else.

When the potato crop failed in 1846, due to a mysterious blight now known to be caused by the fungus *Phytophthora infestans*, the previously healthy population was suddenly faced with widespread famine. The reaction of Parliament was almost completely governed by the dogmatic laissez faire capitalism of the era. "The loss of the potato crop," according to Cecil Woodham-Smith, "was therefore to be made good, without Government interference, by the operations of private enterprise and private firms, using the normal channels of commerce. The government was not to appear in food markets as a buyer, and there was to be no disturbance of the ordinary course of trade." She goes on to point out that "the flaw in the plan was the undeveloped state of the food and provision trade in a great part of Ireland."[6] In short, there were very few shops on the English model, and many of the peasants bought no food and subsisted on the potatoes which they raised.

The results were catastrophic. The countryside became covered with mobs of starving, begging peasants, scavenging for food or work. Unable to pay their rents, they were turned out of their mud huts to starve by the agents of the absentee landlords. On top of all this, typhus and relapsing fever became widespread, and thousands died. The mortality rate of those who caught the fever has been estimated at sixty to seventy percent.[7]

The only answer for many of the peasants was emigration, and vast numbers set out for Liverpool, Canada, and the United States.

It was upon the unsuspecting town of Boston that many of these illiterate, half-starved and fanatically anti-English peasants descended. At first, the people of the U.S. responded with extreme generosity. They sent food, clothing and money to Ireland. But sympathy quickly turned to horror and then to resentment when the impoverished hordes began to disembark at East Boston and filter into the city, converting the heretofore orderly Boston into a morass of beggars and unemployed rabble. They had not a single skill useful in a city oriented to small commercial ventures and high finance. They had no money to proceed to the interior. They were unlettered rural peasants thrust upon a civilized city. As Oscar Handlin puts it, they arrived as and remained as "an undigested and undigestable lump."

The economic opportunities for unskilled labor were so minimal in Boston that even the fugitive slaves passed it by.[8] The new arrivals were suited for only irregular, unskilled menial jobs.

Left: Custom House.

The small businesses could not absorb them and it was not until widespread industrialization developed that they were able to get regular employment. Indeed, until they arrived, the availability of an easily controlled proletariat hindered the development of a factory system in New England.

The immigrants flocked into areas near the waterfront and into the North End. Overnight, cellars became subdivided, shacks were set up in alleys,

and backyards and commercial buildings were bought up by speculators and turned into honeycombs teeming with the new arrivals. In the fetid atmosphere of the newly created slums disease, pauperism, erime, drunkenness, and public disturbance shot to unheard of heights.[9] The lack of light, ventilation, water, heat, and adequate drainage turned these melancholy warrens into pest holes. A report of the Committee on Internal Health describes one sueh scene as "a perfect hive of human beings, without eomforts and mostly without common necessaries (sic.); in many cases huddled together like brutes without regard to age or sex or sense of decency; grown men and grown women sleeping together in the same apartment and sometimes wife and husband, brothers and sisters in the same bed. Under the cireumstances self-respect, forethought, all the high and noble

Above: Beacon Street.

virtues soon die out, and sullen indifference and despair or disorder and intemperance and utter degradation reign supreme."[10]

The chasm between Irish immigrants and native Bostonians ran deeper than the physical surroundings. The Irish had been isolated completely from the intellectual movements in Europe during the preceding 150 years, and they were quick to react against what they perceived as attacks on the Church, the family, or the apocalyptic view of man that they adhered to. Instead of joining the revolutionary spirit sweeping the rest of Europe in 1848, the peasant found himself defending excesses of Spanish and Italian churchmen and opposing reform movements such as abolition of slavery, female suffrage, and enforced education in public schools. To the Irish peasant, life was a mystery of suffering, not to be explained in human terms, and the anthropocentric notions of human betterment, as held by the native populace, wrongly directed one's attention from the only true reward, that of the hereafter.

Scuffles between native rowdies and groups of immigrants were eondemned vigorously in the Boston press as being unworthy of eitizens in a democracy. Although Bostonians were not attracted either to the persons or the ideas of the new immigrants, their tradition of tolerance prevented any measures more stridently anti-Irish than the reform movements with which Boston abounded. As more and more of the Irish became citizens and voters, however, it became apparent that a cohesive immigrant group, totally out of step with the philosophy of the natives, could strongly influence elections and overturn the existing pattern. It was partly out of this fear that groups such as the Know-Nothings arose. Soon the legendary "No Irish Need Apply" signs began to crop up in store windows all over town. Handlin states that as the Irish began to exercise the right to vote, all semblance of toleranee was abandoned.[11]

The nativists realized that Irish domination was inevitable, although they did not live to see it. It was not until the next century that gradually, the political weight of the immigrants became first a eonsideration, and then a controlling force in city and state affairs.

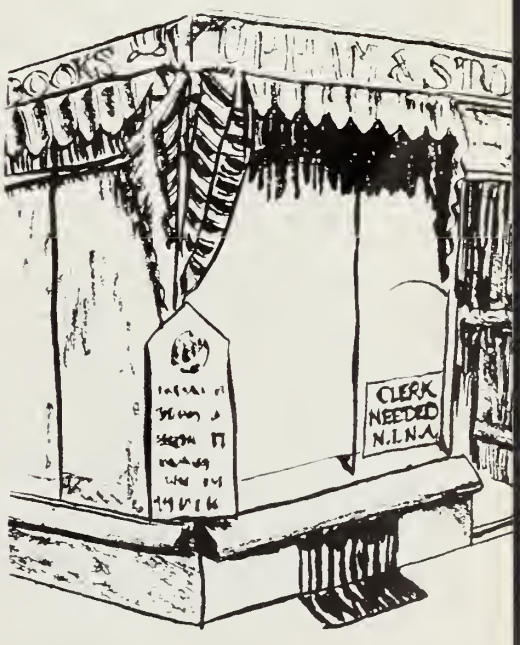
The Ward Boss and the "Politics of Revenge"

The new citizens, isolated as they were religiously, culturally, socially and economically from their fellow Americans, could easily be molded into a cohesive bloc. This was readily seen by the entrepreneurs who were to become the ward bosses to succeeding generations.

The ward boss derived his power from two principal sources, jobs and votes. Simply stated, he attempted to find work for the new arrivals and expected in return the undivided loyalty of the recipient for his eandidates on election day. His increasing eontrol over the voters enabled him to find jobs for them more easily, because, in turn, he could promise support to minor civie offieials, contractors, or factory owners when measures favorable to them came before the public.

In his autobiography, James M. Curley reflects fondly on the ward bosses of his youth:

> By this time [1864 when his father arrived] the ward boss was known as the last court of personal appeal. He was a community advisor, a combination of padrone, father confessor, employer's agent, foster parent, juvenile court judge, and social service worker. He was a person who worked 365 days a year for the little man, a person who made it unnecessary for the down and outer to subject himself to the inquisitorial terrors of organized charity. As a result, he became a key figure in Boston politics. He knew every voter or prospective voter in his domain, and when one of them was thrown into durance vile for gambling, overstaying his leave in one of the numerous alehouses in the neighborhood, or for other contemporary misdemeanors, the ward boss went to his rescue, bailing him out if possible. The ward boss contacted agents of sweatshops eager for dollar eheap labor or interceded with office holders in an effort to find work for the new arrivals, who from the very outset realized that they were second class citizens in "The land of freedom and opportunity. . . ." The ward boss was Mr.



State Street, circa 1860.

> Fixit, a practical politician who in addition to settling family disputes and keeping errant children in line, made sure that the men kept sober enough on election day to vote for the designated candidate.[12]

Martin Lomasney, the most famous of the bosses, ran Ward 8 in the West End, roughly the area from the Massachusetts General Hospital toward Haymarket Square and to the present North Station Area. His view of the function of the boss has been widely quoted: "I think that there's got to be, in every ward, somebody that any bloke can come to—no matter what he's done—and get help. Help, you understand; none of your law and your justice, but help."[13]

Martin was given to epigrammatic turns of phrase and another of his statements aptly sums up the entire system: "All who would aspire to political honors should forever keep in mind that bread cast upon the waters returns in the shape of votes."[14]

Under the deft tutelage of the ward bosses, the continuing waves of Irish immigrants, stimulated to cross the ocean by repeated crop failures in the '60's and '70's, and later Italians and Eastern European Jews, became citizens and they all contributed to the theme of the new politics that was taking shape.

The ward bosses had no knowledge of or interest in the tenets of Lockian or Jeffersonian democracy. To them this was totally irrelevant theorizing. There were crying needs to be met and if the theories stood in the way of results, then they were to be ignored.

A number of interesting devices evolved to insure that the proper candidates were able to join the ranks of the governing class. Lomasney utilized the "mattress vote" to a great extent. On the April preceding a given election, a voting list was made up by the election officials. Lomasney would round up non-residents of his district who were indebted to him and cram them into nearby rooming houses where they could register for the upcoming election. He is reputed on one occasion to have found room for 166 citizens in a single house. The "repeater" was another common figure. His job was to dash about the city on election day, voting in as many precincts as possible, using the names of registered voters who were out of town, in the hospital, or peacefully reposing in the cemetery. Another trick was to steal an official ballot before the election, mark it properly, hand it to the first voter of the day who would deposit it and take out his own blank sheet to the boss or a lieutenant. He would mark it properly and hand it to the next voter who would repeat the process. For illiterate voters, large combs were provided which had the teeth removed at carefully calculated intervals. These were placed on the ballot and an X was placed wherever the teeth were missing.

The bosses in the various Irish wards were by no means unanimous in their ideas of the best candidates for city-wide offices, and since it was well known who was backing whom, it became a matter of pride as well as practicality to get one's own man elected. Immigrant prejudices were played upon ruthlessly in an effort to discredit the opposition. Henchmen would enter an opposition ward dressed in the garb of a Protestant clergyman seeking support of the enemy candidate, or the worthy opposition would be accused by "unimpeachable sources" of being seen eating steak on Friday in the Parker House in the company of Republicans. To the ignorant voters such chicanery was often enough to impart the kiss of death to an Irish political aspirant.

While these weeds were beginning to flourish in the previously orderly garden of city politics, the native population began to undergo changes. Reform groups and committees for all manner of uplifting causes were formed, but, since most of them were unaccompanied by legislative action, they soon descended into fault-finding, and their effect on the immigrants was miniscule. A less obvious change was the loss after the Civil War of the idealism and progressivism which had so characterized the city in the '30's, '40's, and '50's.

Oscar Handlin states that the "generations that had matured after 1860 had recoiled in despair from what their nation and city had become. Surrendering or softening the ideals of their parents, they did not hope to exercise effective leadership. Indeed, disillusioned by the failure of Civil War idealism, which seemed only to lead to the corruption of Reconstruction and the Grant Administration, they now began to question the validity of democracy. Depressed by the ugliness of industrialization and by the vulgarity of its new wealth, the proper Bostonians wished to think of themselves as an aristocratic elite rooted in the country after the English model. They moved out to the rural suburbs of Brookline and Milton and resisted proposals to annex those towns to Boston. They sent their children to private schools and found self-contained satisfaction in their gentlemen's clubs."[15]

The new wealth referred to is that of rural Yankee New Englanders who migrated to Boston and became the captains of industry in the '70's and '80's. They were isolated from the Brahmins because of their arriviste status and their evangelical style of religion. They, and their less wealthy fellows, knew none of the tolerance of the Brahmins and were considerably more anti-Irish, both because they wished to identify with the older families

House Chamber in session.

and to emphasize their separateness from the proletarians into whose ranks they were constantly in danger of falling.

Thus the stratification of society which has marked Boston ever since took root in the postwar era. It left the political affairs of the city to those least fit to handle them—the Irish and the intolerant nouveaux riches who controlled the factories. Boston has paid dearly for this abdication of responsibility by its ruling class.

Meanwhile, the immigrations continued. The population was so constituted in 1885 that Hugh O'Brien, the first Irish-born mayor, was elected. At the turn of the century when James Michael Curley was first elected to the common council, Irish immigrants and their descendents made up almost half of the city's population and had a majority for the first time on the City Council.

When Curley first came upon the scene, the power of the ward bosses was at its height. Among others, Martin Lomasney had the West End under tight control, Patrick J. Kennedy ran East Boston, and John F. Fitzgerald the North End's Ward 6. The latter two dedicated public servants are now better known for being the paternal and maternal grandfathers respectively of President John F. Kennedy.

A succession of parsimonious Yankee mayors, many of whom hailed from Maine, New Hampshire, and rural Massachusetts, had expended much of their energy on keeping down the tax rate and city debt.[16] They thundered against waste, inefficiency, and political partisanship, and generally catered to businessmen and homeowners. The Irish politicians, on the other hand, knew that by increasing city expenditures jobs would again appear and the lot of their followers would improve.

The two themes mentioned at the outset were plainly visible here. Fiscal responsibility and abstract virtue contended mightily with demands for more and more jobs, services and security. Political corruption was by no means limited to immigrant Democrats. The Republican mayors also worked very closely with both the business interests and with the ward bosses, with whose help they won elections. Andrew J. Peters, a Republican reform candidate who held office between two of Curley's terms, was honest himself, with a large private income (offered as proof during his campaign that he would be immune to graft) but gullible and blind to what went on among his supporters. In the office next to his at City Hall, one of his assistants acted as a bagman, selling jobs and contracts to the highest bidder. For a price burlesque shows were not raided and books were not banned. Mayor Peters tut-tutted at the accusations made against his assistants as "mere newspaper sensationalism."[17]

The state legislature, alarmed at the increasing corruption and expense of the city, attempted to impose curbs. The tax rate had for years been set by the legislature. Now the Finance Commission or "Fin Com" was set up to investigate money matters. These measures were inveighed against by Curley and others as the work of "State Street Highjackers and second storey men."

The career of James Michael Curley was an amazing one, and even now the mention of his name evokes strong emotional responses in many Bostonians. In the foreward to his 1949 biography of Curley entitled *The Purple Shamrock*, Joseph F. Dinneen asks the following questions: "How much irreparable harm, if any, has Curley wrought in Boston? How much permanent good, if any, has he accomplished? Why does Boston tolerate him? How does he operate? How did he become as he is? What influence did he have upon the Boston Irish? What influence did they have on him?"[18]

My own view is that when judged according to the standards of his day, Curley was not the worst man who ever lived. He changed the geography and politics of Boston more than any single politician before or since. His methods, applicable perhaps in his time, required his peculiar genius to manipulate them effectively. He created an atmosphere which continued long after his day, and in the hands of less gifted politicians, his methods caused community benefit to decline as rapidly as the corruption increased.

Curley's career began in the old Ward 17 of Roxbury, the Boston City Hospital district. He was elected to the common council and quickly moved to take over the ward from its aging boss, Pea Jacket Maguire. In rapid succession he introduced bills which were both needed reforms and popular with the voters. Such measures included the five and one-half day week for city employees and sanitary plumbing for the city schools. He vigorously attacked Republican graft and corruption at the state level. He tightened the organization of Ward 17 along the lines of Tammany Hall which he studied in depth. As time progressed, he became an articulate, wily debater and acquired an enormous amount of knowledge on every conceivable topic. This was not happenstance. As a bachelor he haunted the Boston Public Library, reading history, biography, law, and speeches of great politicians of years past. These were unusual traits at the turn of the century. The rest was standard ward procedure, feeding widows and orphans, getting jobs for his followers, running picnics, fixing things up with the courts and landlords.[19]

As Curley prepared to run for the Board of Aldermen, he became involved in a scandal from which he learned a great deal. He learned that he could flout the law in the name of a good cause and increase, rather than decrease, his popularity among the Irish. The incident involved an attempt by Curley and an accomplice to get jobs as letter carriers for two men in his district, who were able to do the necessary work, but who were afraid of failing the examinations. Curley and his associate took the exams masquerading as James Hughes and Bartholomew Fahey, but they were recognized, convicted and sentenced to ninety days in Charles Street Jail, where they campaigned for and won the offices they were seeking, to the astonishment of Yankee Boston. Curley explained to his followers that after full contemplation he broke an unjust law, designed by the "interests" to keep honest men from getting jobs. His jail sentence became as asset rather than a liability, and every time it was brought up against him in a campaign, the hapless crusader making the charge was buried under an avalanche of Curley votes.[20] This message was not lost on Curley and in later years he treated very lightly any law he thought unjust.

After two terms in Congress he was ready, in 1914, to run for mayor. In the ordinary course of events, candidates for mayor approached the ward bosses seeking their support and meeting their price. Curley would have none of this. He felt that "the institution" was outmoded by 1911. It was breeding party strife, petty animosity, and cheap political chicanery and was a roadblock in the way of enlightened city govern-

Continued on page 39.

Dr. Gordon (lower right) is professor of preventive medicine and epidemiology, emeritus at Harvard School of Public Health. He is also former director of the Harvard Red Cross Unit and retired Colonel, M.C., U.S. Army. At upper left, the Harvard Preventive Medicine Unit poses at Salisbury, England in July, 1942. At upper right, H.R.H. Queen Mary visits the American Red Cross-Harvard Field Hospital. At left, members of the Unit enjoy their first reunion in 25 years at Ormond Beach, Florida. At lower left, the hospital staff practice their gas mask drill in Salisbury.

Harvard Preventive Medicine Unit

They Went, Worked, Helped to Conquer

by John E. Gordon, M.D.

On march 28, 1966, staff members of the American Red Cross-Harvard Field Hospital Unit met for their first reunion in 25 years—not in England where the Unit was first set up, but in Ormond Beach, Florida. It was a sprightly session, in spite of time's appreciable erosion to some of us.

Of the 82 persons in active service with the Unit, 48 were present, and without exception, we heard from all the rest. We first paid our respects to the six nurses lost at sea on their way to England and to the four other staff members who have since died. The medical staff was represented by Alex Steigman, professor of pediatrics at Mt. Sinai Medical School, Dean Fleming, epidemiologist for the State of Minnesota, and John Degan, district health officer for the New York State Department of Health. Mr. Charles Carr of the Red Cross executive staff and our chief nurse, Gertrude Madley, were also there. Nurses predominated and to everyone's satisfaction, they took charge of the affair.

We received letters from President Conant, Mr. Harriman, present Director of the American National Red Cross, former Dean of Harvard Medical School, C. Sidney Burwell, General Eisenhower, General Mark Clark, Elizabeth the Queen Mother of England, and many others who knew and aided the Unit during its overseas service.

Shortly after the onset of hostilities in August, 1939, President Conant appointed a committee to determine the obligations and responsibilities of an internationally oriented educational institution in a world at war. The defeat at Dunkirk and the evacuation of troops from the European continent in late May of 1940 precipitated matters. A cablegram was sent to the British War Cabinet, offering whatever services might be useful in the time of crisis. This was a courageous and far-sighted action on the part of Mr. Conant and the University, because the U.S. was not then at war, nor had public opinion crystallized on the obligations of the country in a world of turmoil.

The answer to the cablegram was a request for a preventive medicine unit, having competence in the control of communicable disease. Within weeks, conversations were underway in London on the form the unit should take. The original concept was of a staff for field investigation of communicable disease together with a supporting laboratory. British authorities expressed a need for an additional small hospital, not to aid in-patient load, but to gain information on the new problems in infectious disease introdueed by the kind of war being fought. They were many—problems resulting from the mass evacuation of children from bombed cities to the country, the indefinite factor of biological warfare, the aggregation of people in crowded air-raid shelters, the infections incident to traumatic injury during bombing, and the threat to the civilian population of a deranged food and water supply and disposal of wastes.

As the scope of activities broadened, the American Red Cross joined the project. A field hospital was outside the experience of the University and the Red Cross was skilled in such affairs through long-continued activities in disaster relief. The result was that Harvard, through its Medical School and School of Public Health, provided the field and laboratory divisions of the Unit, and the medical staff of the hospital. The Red Cross organized the nursing and administrative staffs, built a prefabricated hospital in the U.S., shipped it to Britain, and erected it on a Salisbury hill-top. The combined facilities became the American Red Cross-Harvard Field Hospital Unit.

This Unit was the first U.S. organization, voluntary or official, to serve overseas during the second World War. For two years, beginning in July, 1940, it worked in the United Kingdom with the Ministry of Health for England. When the U.S. entered the war, the services of the Unit were put at the disposal of the Medical Department of the United States Army on a voluntary basis. Eventually, the Unit became an integral part of the Army, first as General Medical Laboratory A, and later as the First General Medical Laboratory. Its facilities at Salisbury continued as the main support of preventive medicine activities in the European Theater of Operations until the war ended.

The work of the Unit has been recorded in a history by the late Professor F. F. Russell, former professor of preventive medicine and epidemiology at Harvard, and Director of The Rockefeller Foundation. An added, indirect contribution of the Unit has had less emphasis because it has only become evident with the passage of time. The European Theater of Operations, although the main center of combat, had a health record unsurpassed in any other field of action. It even exceeded the health record of troops stationed in the continental United States. Much of this success was due to the fact that from the day war was declared, troops in the ETO had the facilities of an adequate preventive medicine service, staffed by personnel with two years experience in the diseases and health hazards of the area. In other theaters of operation, there was often a delay of six months to a year before fully functioning facilities were available.

At the end of the war, the buildings and equipment of the Unit were presented to the Ministry of Health. Under the direction of the British Medical Research Council, it has become a center for investigation of the common cold and continues to be known as the Harvard Hospital. In the years since the war, its clinical and epidemiological studies have attracted world attention because it was at the Hospital that the rhinoviruses and other infectious agents of upper respiratory infections were first identified.

BOYLSTON DINNER

May 19, 1966

Emulation and Inquiry?

by William Carleton '66 and Loren Roth '66

In honor of the sesquicentennial anniversary celebration of the Boylston Society in 1961, a Directory of active members of this Society was complied. In the brief introduction to that auspicious listing, we are properly informed that the Society has remained true to its founding purpose of "promoting emulation and inquiry among its members through the medium of weekly meetings devoted to the reading and discussing of dissertations on medical and para-medical subjects." The papers, authored by fourth-year medical students, parallel the development of medical science, we are told, and not a few show profound insight into matters of great scientific and human complexity.

But what of the complexity of the authors of these many papers? What insight can the Boylston Topics give us into the future interests and activities of the Society members? Can these senior essays serve as the crystal ball for the would-be prognosticators?

In 1943, a budding Harvard neurologist presented a paper entitled, "Aphasia and Allied Disorders of Language." He began his Boylston presentation with the statement: "It is unfortunate that we have lost the power to recall the details of our childhood—particularly of that period when we first learn to speak and read and write!" Apparently the problem of recalling the details of early childhood held more fascination for this author than the complex neurological problems of apahsia, because John Nemiah '43B ultimately chose psychiatry . . . and he is still chasing those elusive childhoods.

In 1945, another member presented his dissertation on "The Role of the Liver in Protein Metabolism." Was he destined to become one of the great hepatologists of our day? Things didn't turn out that way. Indeed, our author stated in his introduction, "The massive bulk of literature on the liver is an expression of the volumes of research devoted to this organ." Apparently, he decided that these volumes were just

too mueh to ponder and determined, instead, to tackle a field whose frontiers were only skin deep. Yet, Thomas Fitzpatriek '45 must still fondly reeall his first dealings with the liver as he eontinues to contribute to the massive bulk of literature in the field of dermatology.

In 1953, a psychiatrically-oriented HMS senior ehose as his Boylston topic, "Angor Animi." This was an inquiry into the natural history of the feelings of impending doom, or sense of imminent death, which accompany some diseases. After presenting several hypotheses as to the psyehodynamie or pathophysiological etiology of angor animi, our author eoncluded that: "The analytieal balance and the electromanometer must inevitably clash in a room full of armchairs." Do we deteet here a clue that our future psyehiatrist is not really eontent with a room full of armchairs—or eouches? Today we find him working, not at McLean Hospital or at the Massachusetts Mental Health Center, but rather, in the endocrine unit of the Massachusetts General Hospital. (Perhaps, in his address to us tonight, Dan Federman will have some retrospective views of angor animi as he begins a traumatie year as the new president of this illustrious Soeiety.)

What can we eonelude from all this? Through our retrospectoseope, ean we assume that the ehoice of a Boylston topie has any signifieanee for the future of its authors? Drs. Nemiah, Fitzpatrick, and Federman ean show us that there is indeed a correlation—albeit a negative one. Perhaps by examining some of the topies chosen by the Class of '66, we will be able to make a few interesting predietions about the things that they will or will not be doing in the future.

Loren Roth diseussed his "Mind-Body Problem" with us. Sadly, we must forecast that Loren will always be faced with this terrible problem, but even his best friends will not tell him. Perhaps, in neurology, he will find that the two are compatible after all!

From l. to r. Daniel D. Federman '53, president of the Boylston Society. Mrs. Federman, and David C. Poskanzer '54, immediate past-president, listen as Hermann L. Blumgart '21 announces the Boylston prizes.

Edward F. X. Hughes '66 holds the Boylston Society certificate of membership.

"The Fitness of the Organism" was investigated by Ken Falehuk who was worried about the abilities that allow living things to tolerate their environments. In the future, however, unless John Knowles and the Boston Politieos elean up this city, we fear that Ken may be worrying even more about the fitness of the environment for the organism!

Scott McNutt announced the topie of "Foreign Bodies." The audience was excitedly awaiting the presentation of the gross curves of Gina, Sophia and Bridget, but instead Scott focused down on the microscopie beauty of the not-so-shapely macrophage.

April showers brought that dynamie duo of Sox and Trelstad with a discussion of "Eugenies." We now understand that these fearless investigators have preempted Dr. Gardella's office and are setting up on Operation Mateh for all of Boston and after Boston . . . the world!

"The Neurology of Nonsense" was faseinating to Mike Marmor during his last year at HMS. We were recently informed, that at the last Federation Meetings, Mike was seen to be yanked from the speaker's rostrum screaming, "Superealafragilistieexpialodocious" over and over.

Ed Hughes followed with "A History of the Great Surgeon, Halsted." Hughes, too, will gain fame. Frannie Moore, we understand, has erected a plaque in Ed's honor at the Brigham with the following inseription:

> Roses are red; shamrocks are green.
> Surgical tempers must be dirty and mean.

Respectfully submitted,

William Carleton
Loren Roth
Secretaries

ALONG THE PERIMETER

Dr. Baumgartner

First Visiting Professor of Social Medicine

Leona Baumgartner has been appointed the first Visiting Professor of Social Medicine at Harvard Medical School for 1966–67. She will conduct an elective seminar for third-year medical students on the relationship of medicine and community problems.

During her year at HMS, Dr. Baumgartner will also be concerned with the problems of implementing medical care programs. In this capacity, she will have the opportunity to deal firsthand with one of her personal goals—to extend high quality medical care to more people in the U.S. and abroad.

Dr. Baumgartner received the Ph.D. degree in immunology in 1932 and the M.D. degree in 1934 from Yale University. From 1959–62 she was Commissioner of the New York City Department of Health and from 1962–65, Assistant Administrator, Technical Cooperation and Research, Agency for International Development.

In addition to her appointment at the Medical School, she is professor of public health and clinical professor of pediatrics at Cornell Medical College, associate visiting pediatrician at New York Hospital, and visiting lecturer on maternal and child health at Harvard School of Public Health. She is also consultant to the City of Cambridge and the City Manager, Joseph A. DeGuglielmo, for the organization and administration of health and hospital facilities.

Dr. Baumgartner is a Trustee of the Hall of Science, New York City; a fellow of the American Academy of Pediatrics; and honorary fellow of the Royal Society of Health; and a member of the American Orthopsychiatric Association, American Pediatric Society, American Public Welfare Association, Harvey Society, and the American Association of the History of Medicine.

Three Administrative Appointments

Dean Robert H. Ebert has announced the administrative appointments of Mr. Richard J. Olendzki as Assistant Dean for Financial Affairs, and of Mr. Eugene Nathan as Associate Director of Development of the Faculty of Medicine. Both appointments were effective Sept. 1, 1966.

Mr. Olendzki will work with Mr. Henry C. Meadow, Associate Dean for Financial Affairs, and will be responsible for the planning, structuring, and management of the financial details of medical care programs and studies. He received the Bachelor of Commerce degree in 1949 from the University of London, the Doctorate in Economics in 1951 from the London School of Economics, and the M.B.A. degree in accounting and corporate finance in 1953 from the New York University Graduate School of Business Administration. He also holds a certificate in electronic data processing from the Institute of Management at New York University. Mr. Olendzki is a Certified Public Accountant and was formerly Corporate Assistant Comptroller of the Philadelphia Reading Corporation.

Mr. Nathan will work on the capital fund raising campaign of the Harvard School of Dental Medicine. He received the A.B. degree from Colgate University in 1932 and the L.L.B. degree from Yale University in 1935. He is an Associate in the legal firm of DeGraff, Foy, Conway, Holt-Harris in Albany, N.Y. Mr. Nathan was the New England Director of the Cornell University Centennial Campaign, and during 1965–66, he was Director of Deferred Gifts in the Harvard University Graduate School of Business Administration.

Dean Ebert also announced the academic appointment of Patricia H. Quigley as research fellow in law in the Faculty of Medicine. Mrs. Quigley will initiate a review analysis of various state statutes governing the organization and operation of medical care programs. She received the B.S. degree in mathematics from the College of Charleston in 1963 and the L.L.B. degree from Harvard University in 1966.

Associate Clinical Professor at BCH

Florencio A. Hipona has been appointed associate clinical professor of radiology and radiologist-in-charge of Harvard Medical School's Radiological Services at Boston City Hospital. He will also be a member of the executive committee of the department of radiology at HMS.

A native of Cagayan de Oro, Philippines, Dr. Hipona received the M.D. degree in 1955 from the College of Medicine, University of the Philippines. After a residency at the University Hospitals in Madison, Wisc., he joined the Yale School of Medicine in 1960 as a research fellow in cardiovascular radiology. From 1964-66, he was assistant professor of radiology at Yale.

Dr. Hipona is a diplomate of the American Board of Radiology, and is a member of the American Association of University Professors and Sigma Xi.

Dr. Austen

New Professor of Surgery

W. Gerald Austen '55 has been promoted to professor of surgery at Harvard Medical School. He will continue as chief of the Surgical Cardiovascular Research Unit at the Massachusetts General Hospital.

An internationally known cardiac surgeon, Dr. Austen also is vitally interested in the investigative aspects of his field. He has developed original approaches to the physiological investigation of myocardial function and pulmonary blood flow.

Early in his career he studied the effects of intermediary metabolites on oxygen utilization by the myocardium and on myocardial function in the dog, during and after aortic occlusion. These studies revealed a "Crabtree effect" in myocardial metabolism when glucose was added—a finding which has aided the cardiac surgeon in maintaining myocardial integrity during open heart surgery. He also devised a new operation for primary pulmonary hypertension. It includes a cleverly contrived "blow-off" valve between the right and left atria to allow release of blood at times of transient high pressure.

Dr. Austen's current studies are centered on the problem of hypertension in the pulmonary vascular circuit—a series of investigations concerning myocardial revascularization. He is also working in collaboration with the Department of Mechanical Engineering at Massachusetts Institute of Technology, from which he received the B.S. degree in 1951, on an exploration of the biological properties of certain polysalts that show dielectric behavior similar to that of biological materials.

Dr. Landis Receives 1966 Gold Heart Award

Eugene M. Landis, George Higginson Professor of Physiology at Harvard Medical School, received the Gold Heart Award in Oct., 1966. The Award is the highest leadership honor of the American Heart Association and is given for distinguished service in advancing the Association's efforts to combat heart and blood vessel diseases.

Dr. Landis is well-known for his contributions to the physiology of the circulatory system, particularly capillary circulation. His research has included examinations of capillary pressures, studies on the movement of fluid through the human capillary wall in relation to hydrostatic and osmotic factors, and an exploration of the disturbance of vascular function.

For more than three decades, Dr. Landis has been an active member of the Heart Association. He served as editor of the Association's monthly scientific journal, *Circulation Research*, for three-and-a-half years. When he retired recently as editor, he was cited for "his tremendous work, time and effort" which helped to make the publication the highly respected scientific journal it is today.

Charles B. Huggins '24 Shares Nobel Prize

Harvard Medical School proudly salutes Charles Brenton Huggins, from the Class of '24, who recently became our fifth graduate to receive the Nobel Prize in Medicine and Physiology.

Dr. Huggins was co-winner of the 1966 Prize with his "hero in medicine," Dr. Peyton Rous of The Rockefeller Foundation, New York. Dr. Huggins received the Nobel Prize for his discoveries concerning hormonal treatment of cancer of the prostate, and Dr. Rous for his work and discoveries of tumor-inducing viruses.

Dr. Huggins was only just nineteen when he entered HMS in the Fall of 1920. He had received an A.B. degree earlier that year from Acadia College, Nova Scotia. Although he once said, facetiously perhaps, that he thought he had been admitted to Harvard because the School needed more foreign students, his record then and since has more than justified the decisions of all concerned.

Some of his classmates recall that "he seemed to be, by far, the youngest member of the Class," and he was. "He appeared to be rather shy in those days," said one friend, "but he was a likeable fellow with a keen sense of humor—he would sometimes come to class wearing white, woolen trousers and carrying a tennis racket." "He was always a very independent and original thinker," said another friend, "and would take nothing for granted."

Since graduation. Dr. Huggins has been, in his own words, "continuously engaged in the educational process. For the first three years as a learner (at the University of Michigan, Ann Arbor) and then as a teacher for 31 years at the University of Chicago School of Medicine." In 1958 Dr. Huggins gave up teaching and has been "since then engaged in solving jig-saw puzzles of Nature, drinking tea and conversing."

But his life's work has centered about his research, and he believes that "the laboratory bench is the scientist's best friend, and that creative work requires rather serene surroundings."

The scientific discoveries that have come from his laboratory encompass five broad areas. "Every young surgeon," says Dr. Huggins, "goes through a bone phase." And appropriately, the first area of his research dealt with the problems of bone formation and calcification. He was the first to recognize the effect of physiological temperature gradients on bone marrow activity in living animals.

In 1933, Dr. Huggins began studying the physiology and biochemistry of the male reproductive tract. He was among the first to reliably measure the concentration of many components of seminal fluid. He opened a new chapter in the sexual physiology of the male when he introduced the prostatic isolation operation in 1939. The simple surgical procedure provided the means of quantitating the secretory activity of the canine prostate and resulted in the first demonstration of the competitive antagonism between androgen and estrogen action.

His fundamental studies on the physiology of prostatic fluid led him to an understanding of the relationship of the endocrine system to prostatic function, and he began to devise endocrine therapies for prostatic carcinoma. In 1940, he announced the now classic treatment for cancer of the prostate—the administration of female sex hormones or castration. The therapy produced dramatic relief of pain, and objective regressions of the tumors in many patients with far-advanced prostatic carcinomatosis who were previously beyond the help of therapeutic measures. Carcinoma of the prostate is one of the most common cancers in man, and humanity owes deep gratitude to Dr. Huggins.

Over the years, Dr. Huggins has had a deep and continuing interest in circulating proteins as indicators of disease activity. He introduced the concept and the term "chromogenic substrates" and devised elegant but simple methods for the determination of phosphatases, glucuronidase, and esterases.

During the last 15 years, Dr. Huggins has devoted himself to the problem of mammary cancer, which he describes as "one of the noblest problems facing medical investigation." In 1951, he announced the beneficial effects of bilateral adrenalectomy in a substantial proportion of patients with widely disseminated mammary cancer. Dr. Hug-

gins had first suggested bilateral adrenalectomy in 1945, before the discovery of cortisone.

Sir Stanford Cade, in praising Dr. Huggins' courage and vision in approaching cancer chemotherapy, has written:

> Charles Huggins was the first to suggest [in 1945] bilateral adrenalectomy and also the first to practice it. His genius in physiological research, his accuracy of clinical observation, his surgical courage and skill led him to try adrenalectomy in advance of the discovery of cortisone, only to abandon it till replacement therapy became available, when the opportunity was vouchsafed to him once again to try the experiment, this time successfully. Huggins pointed out that the hormones formed in the gonads which sustain mammary and prostatic cancer are formed not in the gonads alone, but also in the adrenal cortex in considerable amounts.

Within the last decade, Dr. Huggins has been concerned with the development of an experimental model for human mammary cancer. He has defined certain molecular properties of polycylic aromatics which selectively induce mammary cancer. All of the active compounds are flat molecules, having double-bond systems and possessing special substituents. They form colored complexes of the charge-transfer type. Dr. Huggins has pointed out that electronic factors in themselves are not the sole determinants of carcinogenicity, but that the size and steric configuration of the molecule is also critical. The molecular geometry of carcinogenic hydrocarbons, certain steroids, and the hydrogen-bonded base pairs in DNA are all very much alike. The molecules fit snugly into a hexagonal box closely molded around the base pairs of DNA. The Huggins plastic box suggests that the interaction of polycyclic hydrocarbons with nucleotide base pairs may be at the heart of the induction of malignancy of the breast.

The honors that have been bestowed upon this man are but a small measure of the esteem in which he is held by the academic and scientific worlds. He holds honorary degrees from six universities. Among his numerous prizes, medals, and lectureships are: two Gold Medals for research from the American Medical Association in 1936 and 1940; the Harvey Lecture in 1946; the Francis Amory Prize of the American Academy of Arts and Sciences in 1948; the Bertner Award of the M.D. Anderson Hospital in Houston in 1953; the Oscar B. Hunter Memorial Award of the American Therapeutic Society in 1962; the Albert Lasker Clinical Research Award in 1963; the Gold Medal of the Rudolf Virchow Medical Society of New York in 1964; and the Passano Award in 1965.

Dr. Huggins is William S. Ogden Distinguished Service Professor at the University of Chicago, and Director of the Ben May Laboratory for Cancer Research. In the laboratory, he is well-known for his motto, "Discoveries are our business" and his admonition to young scientists, "Make damn good discoveries!" Charles B. Huggins took his own advice. He made damn good discoveries his business.

Dean Robert H. Ebert chats with Senator Maurine B. Neuberger outside the Senate hearing room. Senator Neuberger is chairman of the Subcommittee on the Health of the Elderly that held a three-day hearing in September at which Dean Ebert was a witness. The hearing probed the possibility of using modern engineering in health screening techniques. The subcommittee had no legislation, but wanted to explore the possibility of applying modern testing methods to the large scale detection of chronic illness. Dean Ebert told the members that far greater health returns will come from the prevention of disease rather than from the treatment of disease. He testified that he was certain that an early screening of a large number of citizens would be salutary in detecting potential disease, and said that Harvard Medical students are being made aware of the coming automation in the field of medicine. The evidence resulting from this hearing will be presented to the 90th Congress for evaluation as a fundamental concern in future actions for improvement of our health resources. At the conclusion of the hearing, Senator Neuberger said, "we know that automation would free the doctor from many details and would allow him to treat a larger number of patients. This may be one small way to ease the doctor shortage." Senator Neuberger is the wife of Philip Solomon '30.

AT BOSTON CITY HOSPITAL:

Dr. Folkman's Sudden, Chance Discovery Opens New Era in Anesthesiology

The impatience and the innate curiosity of a young instructor in surgery at Harvard Medical School and Boston City Hospital have combined to move the science of anesthesia toward a new and unexpected direction.

In the October 7, 1966 issue of *Science*, M. Judah Folkman '57 wrote, "In the future, any of the anesthesia gases or vapors may be given by vein." Dr. Folkman is instructor in surgery at Harvard Medical School in the Sears Laboratory for Surgical Research and on the Fifth (Harvard) Surgical Service at the Boston City Hospital.

In a chance discovery, Dr. Folkman recently learned that first one, then four, commonly used anesthetic agents diffused through silicone rubber tubing at a steady rate related to the thickness of the tubing and to the length of tubing exposed to the anesthetic agents. Ether was the initial anesthetic agent. Other common agents—halothane, cyclopropane, and nitrous oxide also diffuse readily through the silicone rubber tubing.

The way in which Dr. Folkman made this discovery is of great interest. One recent Saturday morning, when his lab assistant was away, Dr. Folkman was cleaning the various types of tubing used for tissue perfusion. To speed the cleaning process, he flushed the tubes with a solvent—ether. When he returned to the room an hour later, he noted that the silicone rubber tubing continued to smell of ether.

"This indicated to me," he later reported, "that ether had diffused across the wall of the tubing."

His curiosity aroused, he placed a milliliter of ether in a similar tube, sealed the ends with paper clips and placed the tube on a sensitive scale. Constant check revealed that there was a steady weight loss from the tube, evidence that the ether vapor was escaping into the surrounding air. When all of the ether had left the tube, Dr. Folkman noted that the tubing collapsed, indicating that the diffusion of air into the tubing was much slower than the diffusion of ether from the tubing. Several hours passed before the tubing was re-expanded with air.

For the initial test of the new method of administering anesthesia, Dr. Folkman and his associates at the Boston City Hospital, Dr. David M. Long, Jr., instructor in surgery, University of Chicago, and Richard Rosenbaum, a third-year student at Harvard College, duplicated in dogs the artery-vein bypass (of silicone rubber tubing) used in hemodyalisis in humans suffering kidney failure. The initial loop of tubing was approximately 12cm. long. The loop was first dipped into ether and, although ether vapor could be detected in the dog's breath within six minutes, the liquid caused an abnormal breakdown in the red blood cells. When the tubing was exposed to ether vapor, however, no blood difficulties were encountered and again, in six minutes, evidence that the ether was in the aveolar system could be detected in the dog's breath.

By increasing the length of the silicone rubber tubing (usually in a coil form) exposed to the ether vapor, deeper levels of anesthesia were achieved. Shorter lengths of thinner silicone tubing could be substituted for the longer lengths of the thicker tubing, with similar results.

Later, Dr. Folkman exposed the rubber tubing to halothane vapor and cyclopropane gas with equal success. Nitrous oxide, though it too diffused into the bloodstream, produced only light anesthesia.

Seeking to further simplify the administration process, Dr. Folkman and his associates then turned to the catheter principle used in heart research. He used a silicone rubber tube sealed at one end then pierced with many tiny (0.1 mm.) holes. After the holes were pierced, the tubing was recoated with a silicone rubber membrane about .002 inches thick. This tube was then inserted into the femoral vein of a dog for a distance of about 30 mm. Cyclopropane gas was introduced into the catheter at a rate that produced a light anesthesia. Before an anesthetic effect sufficiently deep to permit surgery can be achieved through the latter method, Dr. Folkman reported, catheters with increased diffusion capacity will be needed to more rapidly diffuse the cyclopropane gas into the bloodstream.

"This phenomenon," Dr. Folkman wrote in the *Science* article, "suggests some new directions in the science of anesthesia in that any of the anesthetic gases or vapors may in the future be given by vein. Modern anesthesia techniques require that the concentration of anesthetic be limited to allow space for oxygen, since both must be administered together through the lungs. It is conceivable that with two separate ports, one may in the future administer 100 per cent anesthetic gas through the blood stream and up to 100 per cent oxygen through the lungs as necessary.

"The arteriovenous shunt method (the original method) might," Dr. Folkman continued, "be useful for a burned patient. Anesthesia for dressings or skin grafts could be given at any time during the succeeding weeks by simply inserting a suitable coil or a minature silicone prosthesis into the shunt. This could then be exposed to any of the anesthetic vapors. For sedation and caloric intake, one might conceivably expose the shunt to ethyl alcohol.

"Another possible application of this new diffusion property would be in the vaporization of halothane," Dr. Folkman concluded. "A simple and accurate halothane vaporizer could be made from a coil of silicone rubber tubing. When oxygen is blown through the lumen it would pick up increasing concentrations of halothane vapor as the coil was dipped deeper into liquid halothane.

"At the moment," Dr. Folkman noted, "the single intravenous tube will not allow enough diffusion to reach deep levels of anesthesia. If we can perfect a tube that will, then the more potent anesthetic gases might be administered more safely by vein. This might be very useful in pediatric and thoracic cases and under military conditions."

EDITOR'S NOTE:

In the announcement that Dr. Ronald D. Arky had received the Elliott P. Joslin Research and Development Award (HMAB, Summer 1966), mention was omitted that this award is sponsored by the American Diabetes Association.—ED.

AT PETER BENT BRIGHAM HOSPITAL:

Dr. Kundsin Outlines Measures to Counteract Spread of Infection

For patients, physicians and personnel, the spread of infections in a hospital is a well known "nightmare." Control of infectious hazards requires the institution of several meticulously monitored counter-measures. The Peter Bent Brigham Hospital has a newly built Intensive Care Unit. Within this Unit are housed patients whose conditions make them extremely susceptible to infection.

The countermeasures being used in the Unit were recently described by Ruth B. Kundsin in her address before the annual Clinical Congress of the American College of Surgeons in San Francisco.

Dr. Kundsin, who is research associate in bacteriology and immunology in the School's Department of Surgery at the Brigham Hospital, made the point that "the control of viral, bacterial and fungal infections carries with it a moral responsibility to all who are involved in patient care."

She noted that because microorganisms responsible for infections may be carried in dust, in droplets or in droplet nuclei, and can be transported by patients as well as by hospital personnel, a variety of techniques simultaneously employed are necessary for their destruction: Germicides for the disinfection of large areas: autoclaving or dry heat sterilization of equipment; ultraviolet radiation; adequate air exhaust from the patient's room (at least 40 air changes per hour); and clean, laundered gowns, caps and gloves worn by all nurses and physicians who serve the infected patient.

Miss Sybil Marquis, research technician in Dr. Kundsin's laboratory, is using an air centrifuge to determine the number of bacteria bearing particles in the air.

Dr. Kundsin outlined the processes designed to interrupt the spread of bacteria in the Unit. For instance, air is supplied directly to each room and is exhausted from it into the corridor where return ducts are located. An ultraviolet curtain over each door prevents droplet nuclei from crossing the barrier; floors are cleaned with germicidal detergent and all surfaces within the room are damp dusted with this detergent; and, contact spread is controlled by gown, glove and cap technique for patients with documented clinical infection. When physicians' rounds are made, patients can be viewed and discussed by the group from the door outside the ultraviolet curtain, thus keeping their flora from colonizing the occupants.

All countermeasures, Dr. Kundsin added, also must be accompanied by frequent monitoring of air, floor and equipment on "at least a weekly basis."

Scholarship Established; Honors John H. Taylor '16

In the Editorial (page 9), the point is made that Alumni are aware of their responsibility to future generations of students, and provide financial aid to ensure a continuing democratic distribution of advantages. Not only from Alumni is such aid received, but from many Friends of the School as well.

This year HMS received a generous scholarship from Mrs. Eleanor Taylor, given in memory of her husband, Dr. John Houghton Taylor '16, who died in September, 1964.

The John Houghton Taylor Fund makes it possible for HMS to award a scholarship to another deserving student. This year's recipient of the Taylor Scholarship is Paul E. Gunderson '70.

Since 1964, the following additional Scholarship Funds have been established: Frederic T. Lewis; Walter E. Bauer; George Packer Berry; and George Stutevant MacPherson.

During the last decade, the number of students enrolled at HMS has not significantly increased, but their need for financial support has increased threefold. Whereas in 1956, the total amount of financial aid awarded was $202,457.00 (making the average award to those who needed aid, $585.00), this year's total amount of awards was $602,736.00 (averaging $1,412.00). Clearly, the need will continue to grow.

AN ALUMNI ASSOCIATION FIRST:

Class of 1911 Celebrate Their 55th Reunion

On Sept. 17, a glorious Indian summer day, twelve members of the Class of 1911 met at the Belmont home of Paul D. White '11 to celebrate their 55th year of graduation from HMS.

It was a very special reunion. Never before in the history of the Harvard Medical Alumni Association has there been an official reunion beyond the 50th. And as every HMS Alumnus knows, reunions traditionally are held in May.

In the fall of 1907, 101 members entered the first year class, and in 1911, 90 received the M.D. degree. Today, 28 members of the class are living. Those present at the reunion were:

Dr. Harvard H. Crabtree
Dr. and Mrs. Richard S. Eustis
Dr. and Mrs. Henry S. Forbes
Dr. and Mrs. Somers Fraser
Dr. Ernest Gruening
Dr. and Mrs. Herbert E. Harris
Dr. Albert A. Hornor
Dr. Franklin B. McCarty
Dr. James P. O'Hare
Dr. and Mrs. Edward S. O'Keefe
Dr. William D. Smith
Dr. and Mrs. Paul D. White

The festivities began with cocktails and luncheon after which Dr. White read messages from members of the class unable to attend the reunion. The class heard from Edward P. Bagg of Holyoke, Mass., Frank P. Gaunt of St. Louis, Mo., J. Victor Greenebaum of Cincinnati, Ohio, J. Howard Means of Boston, and Ralph L. Reynolds of Waterville, Maine.

Highlighting the day was a talk by The Honorable Ernest Gruening of Alaska on three phases of his work in the United States Senate. Dr. Gruening, the only HMS graduate who is a U.S. Senator, discussed birth control, the Vietnam war, and the campaign for conservation of our natural resources.

After lunch, Dr. White showed lantern slides of the class at graduation. Later in the afternoon, to burn off some of the calories consumed during lunch, Bocce and horseshoes were suggested, but no one seemed concerned about their caloric intake, and the 55th reunion day ended in sustained, quiet reminiscing for the Class of 1911.

Seated from l. to r. Drs. Fraser, Harris, Gruening, Smith and Crabtree.
Standing from l. to r. Drs. O'Keefe, McCarty, Forbes, O'Hare, White, Horner, and Eustis.

HARVARD MEDICAL SCHOOL ANNOUNCES

The William O. Moseley, Jr. Travelling Fellowships

THE BEQUEST OF JULIA M. MOSELEY MAKES AVAILABLE FELLOWSHIP FUNDS FOR GRADUATES OF THE HARVARD MEDICAL SCHOOL FOR POSTDOCTORAL STUDY IN EUROPE.

The Committee on Fellowships in the Medical School has voted that the amounts awarded for stipend and travelling expenses will be determined by the specific needs of the individual.

In considering candidates for the Moseley Travelling Fellowships, the Committee will give preference to those Harvard Medical School graduates who have—

1. **Already demonstrated their ability to make original contributions to knowledge.**
2. **Planned a program of study which in the Committee's opinion will contribute significantly to their development as teachers and scholars.**
3. **Clearly plan to devote themselves to careers in academic medicine and the medical sciences.**

Individuals who have already attained Faculty rank at Harvard or elsewhere will not ordinarily be considered eligible for these awards.

There is no specific due date for the receipt of applications or for the beginning date of Awards. The Committee will meet once a year in January to review all applications on file. Applicants will be notified of the decision of the Committee by January 31. The Committee may request candidates to present themselves for personal interviews.

Application forms may be obtained from, and completed applications should be returned to:

Secretary, Committee on Fellowships in the Medical School
Harvard Medical School
25 Shattuck Street, Boston, Massachusetts 02115